DOCUMENT RESUME

ED 058 830 HE 002 755

TITLE An Annotated Bibliography on Graduate Education, 1950-71.

INSTITUTION National Academy of Sciences - National Research Council, Washington, D.C.

PUB DATE Jul 71

NOTE 242p.

EDRS PRICE MF-$0.65 HC-$9.87

DESCRIPTORS Administration; Annotated Bibliographies; *College Faculty; *Educational Finance; *Graduate Students; *Graduate Study; *Higher Education

ABSTRACT

This bibliography summarizes most of the pertinent recent literature on the subject of graduate education. The major categories included are: (1) history and development; (2) students; (3) administrators and faculty; (4) structure and functions; (5) instruction and research; (6) manpower; and (7) costs and financing. Topical and author indexes with cross-referencing are provided. (HS)

ED 058830

AN ANNOTATED BIBLIOGRAPHY

ON GRADUATE EDUCATION

1950 - 1971

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Office of Scientific Personnel
National Research Council
2101 Constitution Avenue
Washington, D. C. 20418

July 1971

1

HE 027 55

ED 058830

AN ANNOTATED BIBLIOGRAPHY

ON GRADUATE EDUCATION

1950 - 1971

Office of Scientific Personnel
National Research Council
2101 Constitution Avenue
Washington, D. C. 20418

July 1971

P R E F A C E

The Annotated Bibliography on Graduate Education--1950-71 summarizes most of the pertinent recent literature on the subject, but is intended to be selective rather than exhaustive. It was prepared in the Office of Scientific Personnel under the supervision of Wayne C. Hall as the result of a suggestion made at the Conference on Predoctoral Education in the United States, held at Woods Hole, Massachusetts, in 1969.

The Bibliography provides background information for the National Board on Graduate Education. We hope, however, that this compilation will eventually be useful to other groups--researchers, educators, and administrators--concerned with current and future problems confronting graduate education in the United States.

William C. Kelly, Director
Office of Scientific Personnel
National Research Council
2101 Constitution Avenue
Washington, D. C. 20418
July 1, 1971

F O R E W O R D

Since its inception as a formal educational enterprise in the late 19th century, and particularly during its period of rapid development in the mid-20th century, graduate education in the United States has evolved in both complexity and diversity to its present protean form.

Much has been written about graduate education, mostly in the mode of criticism. To paraphrase Gustave Arlt, one of the more astute of the contemporary reviewers, "graduate education, and particularly the Ph.D., has always been the target of criticism . . . . To read the 'stupendously unentertaining literature' . . . is depressing. And the other cause for depression is the dreary monotony of the dialogue. Everything that is discussed in 1900 is rehashed ten, twenty, sixty years later. The tune never changes, only the language becomes less elegant." This incisive characterization of Arlt's of the cacophonic and iterative nature of much that has been written can be confirmed amply by a brief survey of the literature on graduate education.

If graduate education is to realize its fullest potential as a national resource for the 1970's, the basic parameters that have shaped its evolution, the constraints that impinge upon it today, and the factors most likely to guide its future growth should be understood. The Bibliography was prepared with this intent--to provide background information for the National Board on Graduate Education.

Many excellent articles and comprehensive treatises have been published recently, but most of them focus upon the general subject of higher education. Selected samples are abstracted in this bibliography. Heckman and Martin's Inventory of Current Research on Higher Education may be mentioned as being representative of other general reference sources that are available; it was one of the first publications of the Carnegie Commission on Higher Education in 1968. Directly pertaining to graduate education are the 1969 report of the National Science Board Graduate Education: Parameters for Public Policy and Ann Heiss' recent (1970) Challenges to Graduate Schools.

In preparation of this Annotated Bibliography, literally hundreds of books, monographs, articles, proceedings, papers, and other sources (both published and unpublished) have been reviewed. The plan was to concentrate primarily upon the recent literature (1950-1971)--especially that appearing in the last decade--centering directly on graduate education. However, a few of the historical and classical publications appearing prior to 1950 and other occasional references closely related to or considered to have major influence upon the graduate enterprise are included. The Bibliography focuses upon the traditional areas of graduate education. References concerned mainly with other professional fields, degrees, and programs, such as medicine, law, theology, etc., in general are excluded.

Within these limits, the author has exercised the reviewer's usual prerogative to be selective. Of the over 1,500 publications reviewed, only about 500 abstracts of articles deemed arbitrarily to be the most useful are included. The abstracts are more comprehensive than those usually found in annotated bibliographies and usually give the purpose of the study, the methodology used, the results, and major conclusions and recommendations. The Bibliography is presented topically by author(s) or source(s) by major categories. Topical and author indexes with cross referencing are provided. The deadline for terminating the review was June 1, 1971. All pertinent literature coming to our attention prior to this date is included.

Important references may have been unintentionally omitted from the Bibliography and for this we apologize. We invite users of the Bibliography to help us make future editions of it more useful by sending us emendations.

The preparation and publication of the Bibliography was greatly facilitated by the work of Mrs. Beverly Kuhn and Mrs. Sandra Laidley, who served as project assistants. For their invaluable assistance, I am grateful. I am indebted to other staff members of the Fellowship Office of the Office of Scientific Personnel for their capable and dedicated contributions in reviewing, abstracting, typing, and editing the Bibliography. I sincerely acknowledge their services as well as the encouragement and assistance of Dr. W. C. Kelly, Director of the Office of Scientific Personnel.

Wayne C. Hall

July 1, 1971

TABLE OF CONTENTS

Preface iii

Foreword v

TOPICAL INDEX ix

HISTORY AND DEVELOPMENT 1-23
- Colleges and Universities 1
- Influence and Trends 5
- Organizations: Academic/Governmental/Quasi-Governmental 18

STUDENTS 25-50
- Assistantships and Aid, Preparation and Programs for Assistants 25
- Attitudes and Characteristics, Attrition, Problems, Unrest . . . 28
- Research on Students, Evaluation, Performance 38
- Types of Students and Problems (Foreign, Disadvantaged, Minority, Women) 43

ADMINISTRATORS AND FACULTY 51-57
- Attitudes, Functions and Roles 51
- Governance 56

STRUCTURE AND FUNCTIONS 59-88
- Structure 59
  - External Cooperation 59
  - Growth, Changes and Distribution (Community Colleges, Junior Colleges, Liberal Arts Colleges, Sectarian Colleges and Universities) 62
  - Internal Cooperation, Coordination, Organization and Reorganization 68
  - State Control, State Systems 72
- Functions 75
  - Admissions Mechanisms, Curriculum and Grading 75
  - Autonomy 80
  - Institutional Research 81
  - Legal Challenges 85
  - Purpose and Nature 86

INSTRUCTION AND RESEARCH 89-118
- Admissions: Criteria, Standards, Problems 89
- Degrees: Requirements and Problems 91
- Programs: Field, Interdisciplinary, Cooperative, Special, Teaching, Postdoctoral 102
- Research: Types and Problems 116

MANPOWER 119-148
Degree Production 119
Enrollments 127
Needs and Priorities: National, Employer and Field 130
Projections and Goals 141
Unemployment/Underemployment/Utilization 144

COSTS AND FINANCING 149-177
Changing Federal Support Policies 149
Formulae, Models, Total and Unit Costs 154
Salaries, Faculty and Others 159
Support and Funding 160
Federal Programs, R & D, Standardization 160
Private Foundation Programs 165
Students and Stipends 167
General Support and Factors 176

RECOMMENDATIONS 179-208
Curricula, Degrees, Programs 179
National Policy: Federal Support, Higher Education (Graduate), Science, etc. 185
Planning, Financing, Coordination, Priorities 195
Purpose, Goals, Reforms and Changes 198

AUTHOR INDEX 209

T O P I C A L I N D E X

- ACADEMIC ORGANIZATIONS (including Governmental and Quasi-Governmental)

Anderson, R., 18
Arlt, G., 5, 6, 19
Bates, R., 19
Bohnenblust, H., et al., 20
The Commission on the Humanities, 186
Curle, A., 202
Dennis, L., & R. Jacob, 105
England, J., 20
Fidler, W., 196
Gardner, J., 80
Kroepsch, R., & M. Kaplan, 20
Legislative Reference Service of the Library of Congress, 23
Levien, R., 21
Miller, J., 15
National Academy of Sciences, 21
Rees, C., 16
Selden, W., 21
Subcommittee on Science, Research and Development, 192
Thackrey, R., 22
Walters, E., 101
Wilson, L., 198

- ACCREDITATION (National and Regional)

Arlt, G., 199
Cartter, A., 9
Selden, W., 21
Spurr, S., 71

- ADMINISTRATIVE AND FACULTY SALARIES

Crowl, J., 176
Harris, S., 177
Jacobson, R., 159
Orlans, H., 163
Roethel, D., 159
Russell, J., 152
Tickton, S., 159
Walsh, J., 160

- ADMINISTRATOR'S FUNCTIONS AND ROLES

Arlt, G., 5
Brennan, M., 200
Council of Graduate Schools in the United States, 68
Dearing, B., 10
Elberg, S., 96
Henle, R., 87
Ingraham, M., 53
Nichols, R., 54
Perkins, J., 80

- ADMISSIONS MECHANISMS

Axt, R., 195
Bohnenblust, H., et al., 20
Breneman, D., 154
Burns, R., 75, 76
Cartter, A., 9
The Chronicle of Higher Education, 202
Council of Graduate Schools in the United States, 68
Doerman, H., 76
Graduate Record Examinations Board, 77
Groesbeck, B., 77
Groesbeck, B., et al., 77
Harcleroad, F., 196
Harvey, P., & G. Marco, 89
Hillgarth, J., 78
Kinsman, R., 78
Lannholm, G., 90
Manning, W., 40
McDermott, R., 78
Mehrabian, A., 41, 78
Muscatine, C., 206
Rossmann, J., 79
Snyder, R., 79

- ADMISSIONS STANDARDS (Criteria)

Bonner, J., 199
Burns, R., 75
Carmichael, O., 93
Council of Graduate Schools in the United States, 68
Dennis, L., & R. Jacob, 105
Eckert, R., & R. Keller, 180

Egerton, J., 44
Graham, J., 89
Groesbeck, B., et al., 77
Harvey, P., & G. Marco, 89
Kagan, D., 32
Keniston, K., 33
Kirk, G., 96
Koen, F., 90
Manning, W., 40
Mehrabian, A., 78
Muscatine, C., 206
Rose, A., 47
Rosenhaupt, H., 207
Rossmann, J., 79
Williams, J., et al., 91

- ASSISTANTSHIPS
(Types of Duties, Satisfaction or Dissatisfaction with Role, etc.)

Altbach, P., 28
Chase, J., 27
Chemical and Engineering News, 133
Dubin, R., & F. Beisse, 25
Elder, J., 40
Froomkin, J., 174
Heim, P., & B. Bogard, 25
Heiss, A., 25, 31, 52, 204
Heyns, R., 26
Monson, C., 26
Muscatine, C., 206
Nowlis, V., et al., 27
Office of the Associate Director (Education), 172
Brown, E., 29
Elberg, S., 30
Elder, J., 40
Enarson, H., 30
Fact-Finding Commission on Columbia Disturbances, 30
Furniss, W., 107
Gaff, J., & Associates, 60
Glass, J., & J. Glass, 31
Gordon, D., 31
Hart, F., 203
Heiss, A., 25, 31, 52
Heyns, R., 26
Kagan, D., 32
Katope, C., & P. Zolbrod, 33
Keniston, K., 33
Lester, C., 204
Mayhew, L., 4
Muscatine, C., 206
Nason, J., 206
Norris, L., 87
Odegaard, C., 110
Sanchez, D., 35
Sanford, N., 35, 67
Scully, M., 99
Semas, P., 36
Smith, G., 17
Sullivan, R., 197
Taylor, H., 36
Tippo, O., 36
Toynbee, A., 87
Trow, M., & T. Hirschi, 37
Tucker, A., 37
Tucker, A., et al., 38

- ATTITUDES

Faculty

Garrison, R., 51
Kagan, D., 32
Semas, P., 36
Trow, M., & T. Hirschi, 37
Wilson, R., & J. Gaff, 55

Students

Altbach, P., 28
Axelrod, J., et al., 28
Bayer, A., & R. Boruch, 43
Bowers, F., 93
Brandt, T., 167

- ATTRITION
(Dropouts)

Carmichael, O., 93
Heiss, A., 82
Heist, P., 32
House, J., 32
Kagan, D., 32
Koen, F., 90
Office of Education, 129
Renetzky, A., 34
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49

- AUTONOMY

Bowen, H., 200
Gardner, J., 80
Harcleroad, F., 196
Harris, S., et al., 65
Hofstadter, R., & W. Smith, 2
Kerr, C., 13, 66
Kidd, C., 117
Mayhew, L., 4
Muirhead, P., 16
Nason, J., 206
Perkins, J., 67, 80
Seaborg, G., 191
Sims, A., 80
Wilson, L., 72, 75, 81

- BIRTH RATES
(Current and Projected)

Bogue, D., 141
Office of Education, 129

- BRAIN DRAIN
(Migration)

College Entrance Examination Board, 44
Sims, A., 47
Springer, G., 48

- CHANGING FEDERAL SUPPORT POLICIES

American Council on Education, 149, 160
Association of American Universities, 185
Babbidge, H., 149
Bock, R., 167
Bowen, H., 176
Carnegie Commission on Higher Education, 185
Cartter, A., 9
Cartter, A., & R. Farrell, 141
Chemical and Engineering News, 127
The Chronicle of Higher Education, 167
Commission on MIT Education, 179
Committee on Research in the Life Sciences, 206
Crowl, J., 176
Dure, L., 133
Economic Concerns Committee, 130
Farrell, R., & C. Andersen, 155
Froomkin, J., 174
Harris, S., 188
Haworth, L., 150
Heiss, A., 204
Higher Education and National Affairs, 189
Johnson, L., 150
Kidd, C., 150
Lear, J., 151
Legislative Reference Service of the Library of Congress, 23
McNett, I., & R. Jacobson, 151
Morse, J., 162
Muirhead, P., 16
National Science Board, 190
National Science Foundation, 163
Office of Economic and Manpower Studies, 152
Office of Scientific Personnel, 147
Office of the Assistant Secretary for Planning and Evaluation, 192
Page, J., 111
President's Science Advisory Committee, 193
Rhodes, H., et al., 164
Rivlin, A., 152
Russell, J., 152
Seaborg, G., 191
Sullivan, R., 197
Walsh, J., 175
Wilson, L., 194
Wolk, R., 153
York, C., 153, 194

- CREATIVITY
(Fostering, Recognizing, Measuring)

Axelrod, J., et al., 28
Committee on the Student in Higher Education, 29
Dennis, L., & R. Jacob, 105
Glass, J., & J. Glass, 31
Harris, S., et al., 65
Heist, P., 32
Koen, F., 90
Lowry, H., 33
Sanford, N., 35

● CURRICULA

Alpert, D., 116
Arlt, G., 6
Axelrod, J., et al., 28
Barzun, J., 1
Bowdoin College, 63
Breneman, D., 154
The Carnegie Commission on Higher Education, 201
Carnegie Quarterly, 94
The Chronicle of Higher Education, 202
Gaff, J., & Associates, 60
Harcleroad, F., 196
Harrison, W., 65
Hefferlin, J., 66
Heiss, A., 204
Mayhew, L., 4, 14
Muscatine, C., 206
Nichols, R., 98
Norris, L., 87
Secrest, L., 113
Spurr, S., 71
Union for Research and Experimentation in Higher Education, 71
Whaley, W., 88

● DEGREES AND REQUIREMENTS

General

American Association of State Colleges and Universities and the National Conference on the Intermediate Degree, 91
Arlt, G., 6, 179, 199
Berelson, B., 8, 92
Brennan, M., 200
Carmichael, O., 93
The Carnegie Commission on Higher Education, 201
The Carnegie Foundation for the Advancement of Teaching, 127
Carnegie Quarterly, 104
Chemical and Engineering News, 133
Commission on MIT Education, 179
Elberg, S., 96
Froomkin, J., 142
The Goals Committee, 198
Henze, R., 123
Jewett, J., et al., 108
Koen, F., 90
Magoun, H., 124
McCarthy, J., 97
Muelder, M., 98
Rees, M., 111
Rosenhaupt, H., 207
Smith, A., & J. Fischer, 113
Spurr, S., 71, 100
Walters, E., 101
Western Interstate Commission for Higher Education, 102

Doctoral

Alciatore, R., & R. Eckert, 38
The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States, 92
Bowdoin College, 63
Bowers, F., 93
Carnegie Quarterly, 94
Cohn, V., 186
Cordasco, F., 10
Cordozier, V., 94
Council of Graduate Schools in the United States, 68, 95
Dunham, E., 73
Elder, J., 40, 106
Folger, J., 96
Glenny, L., 203
Handler, P., 188
Heiss, A., 25, 31, 204
Higher Education and National Affairs, 189
Lester, C., 204
Magoun, H., 14
Muscatine, C., 206
Nichols, R., 98
Page, J., 111
Pelczar, M., 125
Rees, M., 99
Renetzky, A., 34
Schatte, C., 42
Tucker, A., et al., 38
Weisinger, H., 101
Williams, J., et al., 91

Master's

Baskin, S., 62
Beach, L., et al., 46
Carmichael, O., 93
Council of Graduate Schools in the United States, 95
House, J., 32
Huganir, G., et al., 99
Spurr, S., & D. Spriesterbach, 100

Problems Pertaining to Degrees (Language, Requirement, Length of Time to Obtain, Dissertation, Field of Study)

Alciatore, R., & R. Eckert, 38
Allen, D., 91, 102
The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States, 92
Axt, R., 195
Berelson, B., 92
Bowers, F., 93
Brennan, M., 200
Carmichael, O., 93
The Carnegie Commission on Higher Education, 201
Chase, J., 27
Commission on MIT Education, 179
Council of Graduate Schools in the United States, 95
Cronon, E., 104
Dearing, B., & G. Lederer, 10
Dunham, E., 73
Eckert, R., & R. Keller, 180
Elberg, S., 96
Elder, J., 40, 106
Folger, J., 96
Heiss, A., 25, 31, 82, 204
Hobbs, W., & G. Anderson, 170
Jewett, J., et al., 108
Kirk, G., 96
Lester, C., 204
McMurrin, S., 98
Muelder, M., 98
Muscatine, C., 206
Office of Planning and Policy Studies, 171
Page, J., 111
Rosenhaupt, H., 207
Scully, M., 99
Terman, F., 114
Tucker, A., 37
Walters, E., 101
Warkov, S., et al., 175
Weisinger, H., 101

● DEGREE PRODUCTION (Current Rate per Field and Projected Needs)

Alberty, R., 119
Anderson, R., 131
Aurbach, R., et al., 119
Berelson, B., 92
Boffey, P., 131
Breneman, D., 154
Bridgman, D., 120
Brode, W., 132
Bryant, J., 120
Bureau of Labor Statistics, 126
Caffrey, J., 200
Cartter, A., 120, 132, 146, 154, 201
Cohn, V., 186
Connor, J., 39
Creager, J., & L. Harmon, 121
Duren, W., 133
Eells, W., 121
Falk, C., 122
Ferriss, A., 12
Folger, J., et al., 142
Frankel, M., 122
Glenny, L., 203
The Goals Committee, 198
Haggstrom, G., 128
Hall, W., 135, 143
Henze, R., 123
Jewett, J., et al., 108
Lehmann, P., 123
Magoun, H., 124
Martino, J., 144
Mayhew, L., 205
Miller, J., 15
National Science Foundation, 124, 137
Nichols, R., 98
Office of Scientific Personnel, 124, 147
Page, J., 111
Panel on the Plant Sciences, 136
Pelczar, M., 125
Rosenthal, N., & J. Hedges, 125

Scully, M., 99
Strassenburg, A., 139
Terman, F., 114, 126
Tunnell, G., 140
York, C., 153, 194

- DRAFT PROBLEMS

Science, 128
Sullivan, R., 197

- ECONOMIC FORMULAE, MODELS, TOTAL AND UNIT COSTS

Bowen, H., 176
Breneman, D., 154
Carnegie Commission on Higher Education, 185
Cartter, A., 154, 155
Council of Graduate Schools in the United States, 68
Crowl, J., 176, 177
Farrell, R., & C. Andersen, 155
Firman, P., et al., 156
Froomkin, J., 174
Glenny, L., 203
Hamelman, P., 156
Harris, S., 177, 188
Heiss, A., 82
Lelong, D., & W. Mann, 83
Peters, M., 157
Radner, R., & L. Miller, 138
Rossi, P., 70
Russell, J., 152
Siegel, B., 157
Stewart, C., & J. Hartley, 158
University of Illinois, 158
York, C., 153, 194

- ENROLLMENTS
(Rate and Projections)

American Council on Education, 127
Bridgman, D., 120
Carnegie Commission on Higher Education, 185
The Carnegie Foundation for the Advancement of Teaching, 127
Cartter, A., 9, 201
Chemical and Engineering News, 127
Crawford, B., 10
Division of Science Resources and Policy Studies, 170
Eurich, A., et al., 64
The Federal Interagency Committee on Education, 168
Ferriss, A., 12
Folger, J., & C. Nam, 129
Haggstrom, G., 128
Hall, W., 135, 143
Higher Education and National Affairs, 189
Jewett, J., et al., 108
Lecht, L., 136
Martino, J., 144
Mayhew, L., 14
Millard, R., 205
National Science Board, 138
Office of Education, 129
Office of the Associate Director (Education), 172
Rivlin, A., 152
Russell, J., 152
Science, 128
Scully, M., 139
Student Support Study Group, 169
Thompson, R., 129
Wilson, L., 75

- EVALUATION OF STUDENTS' PERFORMANCE
(Grading Systems, Comprehensives, Thesis Defense, etc.)

Cieboter, F., 39
Elder, J., 40
Gaff, J., & Associates, 60
Harris, S., et al., 65
Heiss, A., 31
Heist, P., 32
Heyns, R., 26
Kagan, D., 32
Lannholm, G., et al., 40
Mehrabian, A., 41
Muscatine, C., 206
Reilly, R., 42
Rossmann, J., 79

- EXTERNAL COOPERATION AMONG INSTITUTIONS, GOVERNMENTS, BUSINESS AND INDUSTRY

Benezet, L., 59
Borman, A., 59
Brennan, M., 200
The Carnegie Commission on Higher Education, 195
Committee on Federal Laboratories, 59
Curle, A., 202
Fey, J., 60
Gaff, J., & Associates, 60
Harrison, W., 65
Heiss, A., 204
Johnson, L., 150
Kelly, S., 181
Knight, D., 67
Lavergne, D., 45
McConnell, T., 60
Messersmith, J., 61
Rossi, P., 70
Seaborg, G., 191
Selden, W., 21
Smith, G., 17
Stewart, B., 61
Taylor, H., 184
Walters, E., 101
Wenberg, S., 61
Western Interstate Commission for Higher Education, 102
Wilson, L., 72
Yegge, R., 208

- FACULTY FUNCTION AND ROLE

Arlt, G., 198
Brown, D., 51
Heiss, A., 53
Ingraham, M., 53

- FEDERAL SUPPORT PROGRAMS (Fellowships, Grants, Loans, etc., HEW, NSF, NIH, NDEA, NASA, GI Bill, Fulbright, State Department)

Advisory Committee for Science Education to the National Science Board, 181
Advisory Committee on Governmental Programs in the Behavioral Sciences, 162
American Council on Education, 149, 160
Arlt, G., 19
Association of American Universities, 185
Axt, R., 195
Babbidge, H., 149
Bock, R., 167
Boffey, P., 131
Caffrey, J., 200
Carnegie Commission on Higher Education, 185
Chase, J., 173
The Chronicle of Higher Education, 167
Cohn, V., 186
College Entrance Examination Board, 44
Commission on Federal Relations, 161
Commission on Instructional Technology, 184
Committee for the Survey of Chemistry, 109
Committee on Physics and Society, 161
Comptroller General of the United States, 161
Cunningham, D., 187
Division of Science Resources and Policy Studies, 170
DuBridge, L., 187
Dure, L., 133
Duren, W., 133
Eurich, A., et al., 64
Falk, C., 168
The Federal Interagency Committee on Education, 168
Friedrich, L., et al., 169
Froomkin, J., 174
Hall, W., 135
Handler, P., 188
Harris, S., 177
Harris, S., et al., 65
Haworth, L., 150
Jewett, J., et al., 108
Johnson, L., 150
Johnson, W., & F. Colligan, 162
Kerr, C., 66
Kidd, C., 150
Lavergne, D., 45

Lear, J., 151
Legislative Reference Service of the Library of Congress, 23
Mayhew, L., 14
McNett, I., & R. Jacobson, 151
Miller, J., et al., 172
Morse, J., 162
National Science Board, 190
National Science Foundation, 163
Office of Planning and Policy Studies, 171
Office of the Assistant Secretary for Planning and Evaluation, 192
Office of the Associate Director (Education), 172
Orlans, H., 163
Panel on Educational Innovation, 197
Predmore, R., 172
Reitz, J., 164
Rhodes, H., et al., 164
Rivlin, A., 152
Sawyer, R., 118
Seaborg, G., 191
Smith, A., & J. Fischer, 113
Student Support Study Group, 169
Taylor, H. S., 22
U. S. Advisory Commission on International Educational and Cultural Affairs, 192
Valien, P., 49
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Walsh, J., 175
Walters, E., 101
Warkov, S., et al., 175
York, C., 153
Young, F., 115

● FOREIGN INFLUENCES ON THE HISTORY AND DEVELOPMENT OF GRADUATE EDUCATION

Arlt, G., 6
Armytage, W., 7
Barzun, J., 1
Burn, B., et al., 63
Cordasco, F., 10
Dundonald, J., 11
Horton, B., 12
Kerr, C., 13
Spurr, S., 100
Storr, R., 17
Veysey, L., 5
Walters, E., 101

● FOREIGN STUDENTS

Cieboter, F., 39
College Entrance Examination Board, 44
Lavergne, D., 45
Office of Planning and Policy Studies, 171
Sanders, I., & J. Ward, 112
Simpson, R., 47
Sims, A., 47
Springer, G., 48

● GOVERNANCE, ROLE OF (Administrators, Faculty, and Students)

Altbach, P., 28
Brown, E., 29
Commission on MIT Education, 179
Corson, J., 56
Elberg, S., 30
Enarson, H., 30
Gardner, J., 80
Garrison, R., 51
Glass, J., & J. Glass, 31
Harcleroad, F., 196
Heard, A., 52
Heyns, R., 204
Kerr, C., 56
Lester, C., 204
Nason, J., 206
Perkins, J., 80
Prior, M., et al., 70
Saiki, P., et al., 46
Semas, P., 36
Shils, E., 57
Smith, G., 17
Spurr, S., 71
Taylor, H., 36
Tippo, O., 36
Vanderhoof, J., et al., 56
Wilson, R., & J. Gaff, 55

- GRADUATE EDUCATION'S EFFECT ON UNDERGRADUATE EDUCATION

Adkisson, V., et al., 182
Carmichael, O., 93
Carnegie Quarterly, 104
Dubin, R., & F. Beisse, 25
Jencks, C., & D. Riesman, 3
McGrath, E., 97

- GROWTH, CHANGE AND DISTRIBUTION OF INSTITUTIONS

Alexander, W., 62
Axelrod, J., 62
Baskin, S., 62
Berelson, B., 92
Bowdoin College, 63
Burn, B., et al., 63
The Chronicle of Higher Education, 202
Cooke, W., 64
Eurich, A., et al., 64
Ferriss, A., 12
The Goals Committee, 198
Graduate College News, 74
Harris, S., et al., 65
Harrison, W., 65
Hefferlin, J., 66
Kerr, C., 66
Knight, D., 67
Mayhew, L., 4
National Science Board, 138
Perkins, J., 67
Sanford, N., 67
Smith, G., 17
Toynbee, A., 87
Veysey, L., 5
Wilson, L., 75

- HISTORY AND DEVELOPMENT

Colleges

Adkisson, V., et al., 182
The Carnegie Commission on Higher Education, 195
Devane, W., 2
Dunham, E., 73
Greeley, A., 65
Hofstadter, R., & W. Smith, 2
Jencks, C., & D. Riesman, 3
King, J., 74
Mayhew, L., 4
Miller, C., 4
Office for Advancement of Public Negro Colleges, 4
Rudolph, F., 17
Storr, R., 17

Universities

Arlt, G., 5
Barzun, J., 1
Flexner, A., 2
Greeley, A., 65
Hofstadter, R., & W. Smith, 2
Jencks, C., & D. Riesman, 3
Kerr, C., 13
Magoun, H., 14
Nichols, D., & O. Mills, 45
Odegaard, C., 207
Oliver, W., 5
Perkins, J., 67
Rees, C., 16
Rudolph, F., 17
Seaborg, G., 191
Storr, R., 17

- INSTITUTIONAL RESEARCH (Self-Evaluation)

Alciatore, R., & R. Eckert, 38
Astin, A., 39
Bonner, J., 199
Carmichael, O., 93
Cartter, A., 155
Clark, J., & J. Clark, 81
Commission on MIT Education, 179
Crowl, J., 176, 177
Eckert, R., & R. Keller, 180
Ferriss, A., 12
Hamelman, P., 156
Harcleroad, F., 196
Kagan, D., 32
Koenig, H., et al., 82
Lelong, D., & W. Mann, 83
Mayhew, L., 205
Miller, J., 83
Office of Economic and Manpower Studies, 84, 152
Riesman, D., 84

Semas, P., 36
Stewart, C., & J. Hartley, 158
Western Interstate Commission for Higher Education, 84
Wilson, L., 81, 198

- INTERNAL COORDINATION WITHIN THE INSTITUTION

Alpert, D., 116
Arlt, G., 6
Aronoff, S., 68
The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States, 92
Axelrod, J., 62
Breneman, D., 154
The Chronicle of Higher Education, 202
Commission on MIT Education, 179
Council of Graduate Schools in the United States, 68
Crawford, B., 69
Cunningham, D., 187
Dressel, P., et al., 69
Harris, S., et al., 65
Heard, A., 52
Hefferlin, J., 66
Hodgkinson, H., 69
Kerr, C., 66
Muscatine, C., 206
Perkins, J., 67
Prior, M., et al., 70
Richard, R., et al., 34
Scully, M., 99
Shils, E., 57
Spurr, S., 71
Union for Research and Experimentation in Higher Education, 71
Weaver, J., 71
Wilson, L., 72, 75, 198

- LEGAL CHALLENGES TO THE UNIVERSITIES

Holloway, J., 85
Turner, J., 85

- LIBRARIES

The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States, 92
Barzun, J., 1
Tickton, S., 140
Union for Research and Experimentation in Higher Education, 71

- MINORITY STUDENTS

Arlt, G., 199
Bayer, A., & R. Boruch, 43
Beach, L., et al., 46
Bryant, J., 120
Bullock, H., 1
Carlisle, D., 43
The Carnegie Commission on Higher Education, 185, 195
Cass, J., 44
The Chronicle of Higher Education, 202
Danforth News and Notes, 165
Egerton, J., 44, 73, 106
Elder, J., 106
Fact-Finding Commission on Columbia Disturbances, 30
Friedrich, L., et al., 169
Furniss, W., 107
Hartshorn, H., 45
Jencks, C., & D. Riesman, 3
Mayhew, L., 14, 15
Miller, C., 4
Muscatine, C., 206
Nash, G., 41
Nichols, D., & O. Mills, 45
Office of the Assistant Secretary for Planning and Evaluation, 192
President's Commission on Campus Unrest, 190
Rose, A., 47
Saiki, P., et al., 46
University of California Los Angeles, 49

Valien, P., 49
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Woodrow Wilson National Fellowship Foundation, 166

- NATIONAL NEEDS FOR MANPOWER (Academic, Field, Government, Industry, Business, and Society)

Anderson, R., 131
Association of American Universities, 185
Axt, R., 195
Bock, R., 167
Boffey, P., 131, 145
Bogue, D., 141
Brode, W., 132
The Carnegie Foundation for the Advancement of Teaching, 127
Cartter, A., 9, 120, 132
Chemical and Engineering News, 133
The Chronicle of Higher Education, 167
Cohn, V., 186
Committee on Manpower, 130
Division of Science Resources and Policy Studies, 170
Dure, L., 133
Duren, W., 133
Economic Concerns Committee, 130
Engineering Manpower Commission, 134
Engineering Research Committee, 134
Ferriss, A., 12
Froomkin, J., 174
Glass, J., & J. Glass, 31
The Goals Committee, 198
Hall, W., 135, 143
Harcleroad, F., 196
Harmon, L., 165
Harrar, J., 135
Harris, S., et al., 65
Heiss, A., 204
Kidd, C., 150
Lecht, L., 136, 143
Mayhew, L., 205
National Manpower Policy Task Force, 137
National Register of Scientific and Technical Personnel, 138
National Science Board, 138
National Science Foundation, 124, 137
Panel on Plant Sciences, 136
Radner, R., & L. Miller, 138
Rogers, J., 140
Rosenthal, N., & J. Hedges, 125
Scully, M., 139
Seaborg, G., & J. Barzun, 183
Strassenburg, A., 139
Terman, F., 114
Tickton, S., 140, 159
Tunnell, G., 140
York, C., 153, 194

- POSTDOCTORAL PROGRAMS

Committee for the Survey of Chemistry, 109
Green, A., 107
National Research Council, 110
Office of Planning and Policy Studies, 171
Spurr, S., 100

- PRIVATE FOUNDATION SUPPORT (Danforth, Rockefeller, Ford, etc.)

Axt, R., 195
Beach, L., et al., 46
Chase, J., 173
The Chronicle of Higher Education, 167
Danforth News and Notes, 165
Friedrich, L., et al., 169
Harmon, L., 165
Morison, R., 166
Office of Planning and Policy Studies, 171
Taylor, H. S., 22
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Walters, E., 101
Woodrow Wilson National Fellowship Foundation, 166

- PROGRAMS

General

Alberty, R., 119
Alciatore, R., & R. Eckert, 38
American Institute of Physics, 103
Arlt, G., 6, 19, 179, 199
The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States, 92
Bonner, J., 199
Caffrey, J., 200
Carlisle, D., 43
Carmichael, O., 93
Cartter, A., 9
The Chronicle of Higher Education, 202
Committee on Federal Laboratories, 59
Council of Graduate Schools in the United States, 95
Crawford, B., 10
Cronon, E., 104
Crowl, J., 177
Dennis, L., & R. Jacob, 105
Duren, W., 133
Egerton, J., 73
Elder, J., 40, 106
Graham, J., 89
Handler, P., 107
Harcleroad, F., 196
Harris, S., et al., 65
Heiss, A., 31
Higham, J., 12
Lester, C., 204
Lowry, W., 109
Mayhew, L., 4
McCain, J., 109
McCarthy, J., 97
Miller, J., 15
Muelder, M., 98
Muirhead, P., 16
Muscatine, C., 206
Nichols, R., 98
Odegaard, C., 110
Roose, K., & C. Andersen, 111
Russell, J., 152
Sanders, I., & J. Ward, 112
Schatte, C., 42
Smith, A., & J. Fischer, 113
Terman, F., & G. Reeling, 114
Weaver, C., 115
Woodrow Wilson National Fellowship Foundation, 166
Young, F., 115

Black Studies

Elder, J., 106
Furniss, W., 107
Nichols, D., & O. Mills, 45

Cooperative

College Entrance Examination Board, 44
Committee on Federal Laboratories, 188
Kelly, S., 181
Sims, A., 47

Engineering

Engineering Manpower Commission, 134
The Goals Committee, 198
Harmon, L., 165
Peters, M., 157

Humanities

Allen, D., 102
Arlt, G., 103
Bush, D., 104
Butterfield, V., 104
The Commission on the Humanities, 186
Elder, J., 106
Morison, R., 166
Seaborg, G., & J. Barzun, 183
Whaley, W., 88
Woodrow Wilson National Fellowship Foundation, 166

Interdisciplinary

Alpert, D., 116
Arlt, G., 103
Cunningham, D., 187
Handler, P., 180
Secrest, L., 113

Professional

Carnegie Commission on Higher Education, 185
Tickton, S., 140

Sciences

Advisory Committee for Science Education to the National Science Board, 181
Anderson, R., 131
Aurbach, R., et al., 119
Bush, D., 104
Chemical and Engineering News, 133
Committee on Research in the Life Sciences, 206
Dean, D., 180
Duren, W., 133
Handler, P., 180
Hobbs, W., & G. Anderson, 170
Jewett, J., et al., 108
Kruskal, W., 108
National Science Board, 182
Office of Economic and Manpower Studies, 152
Orlans, H., 163
Page, J., 111
Rees, M., 111
Report of the President's Task Force on Science Policy, 191
Seaborg, G., & J. Barzun, 183
Subcommittee on Science, Research, and Development, 192
Terman, F., 114
Whaley, W., 18, 88

Social Sciences

Advisory Committee on Governmental Programs in the Behavioral Sciences, 162
American Council of Learned Societies Devoted to Humanities, 103
Butterfield, V., 104
Cronon, E., 104
Hobbs, W., & G. Anderson, 170
Kruskal, W., 108
Landgraf, J., 109
Morison, R., 166
Orlans, H., 163
Ruggles, N., 112
Subcommittee on Science, Research, and Development, 192
Woodrow Wilson National Fellowship Foundation, 166

Special
(Innovations, Continuing Education, Disadvantaged, etc.)

Arlt, G., 199
Commission on Instructional Technology, 184
Egerton, J., 44, 73, 106
ETS Developments, 105
Schultz, J., 182
University of California, Los Angeles, 49
Weaver, J., 71
Ziegler, J., 115

Teacher Preparation

Alciatore, R., & R. Eckert, 38
Berelson, B., 8
Carnegie Quarterly, 104
Chase, J., 27
Coordinating Council for Higher Education, 94
Dean, D., 180
Haggstrom, G., 128
Heiss, A., 25
Heyns, R., 26
Koen, F., 90
McCarthy, J., 97
McGrath, E., 97
Monson, C., 26
Muscatine, C., 206
Nowlis, V., et al., 27
Taylor, H., 184
Weaver, W., 208

● PROJECTIONS OF MANPOWER NEEDS

Alberty, R., 119
American Council on Education, 127
Berelson, B., 92
Bock, R., 167

Boffey, P., 145
Brode, W., 132
Bureau of Labor Statistics, 126
The Carnegie Foundation for the Advancement of Teaching, 127
Cartter, A., 9, 120, 132, 201
Cartter, A., & R. Farrell, 141
Chemical and Engineering News, 146
The Chronicle of Higher Education, 167
Committee on Manpower, 130
Engineering Manpower Commission, 134
Folger, J., 129
Folger, J., et al., 142
Froomkin, J., 142
Haggstrom, G., 128
Hall, W., 135, 143
Kerr, C., 66
Lear, J., 151
Lecht, L., 136
Lehmann, P., 123
Logan, A., 54
Martino, J., 144
Office of Education, 129
Rogers, J., 140
Rosenthal, N., & J. Hedges, 125
Scully, M., 139
York, C., 194

● PURPOSE AND NATURE OF INSTITUTIONS

Folger, J., 86
Gross, E., & P. Grambsch, 86
Henle, R., 87
Norris, L., 87
Toynbee, A., 87
Whaley, W., 88

● QUALITY OF FACULTY

The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States, 92
Brennan, M., 200
Committee on Federal Laboratories, 59
Dean, D., 180
Gaff, J., & Associates, 60
Heiss, A., 31, 52, 82
Kelly, S., 181
Mayhew, L., 4
Muscatine, C., 206
National Science Board, 138
Orgel, S., & A. Zwerdling, 55
Orlans, H., 163
Reitz, J., 164
Roose, K., & C. Andersen, 111
Rosenhaupt, H., 207
Schier, R., 55
Smith, G., 17
Taylor, H., 36
Tucker, A., 37
Tucker, A., et al., 38
Weaver, C., 115

● RECOMMENDATIONS FOR THE FUTURE

Disciplinary and Interdisciplinary Programs

Aronoff, S., 68
Commission on MIT Education, 179
Crawford, B., 69
Cunningham, D., 187
Dressel, P., et al., 69
Engineering Research Committee, 134
Heyns, R., 26
Lester, C., 204
National Science Board, 182
Office of Scientific Personnel, 189
Predmore, R., 172
Secrest, L., 113
Weaver, W., 208

Geographical Needs

Armytage, W., 7
Farrell, R., & C. Andersen, 155
Harris, S., 177
Haworth, L., 150
Johnson, L., 150
Kelly, S., 181
Magoun, H., 197
National Science Board, 138
Seaborg, G., 191
Terman, F., & G. Reeling, 114

Goals

Millard, R., 205
Weaver, W., 208

Measurements of Quality (Criteria)

Carnegie Commission on Higher Education, 185
Chemical and Engineering News, 133
Harris, S., 177, 188
Miller, J., 83
National Science Board, 138, 190
Orlans, H., 163
Roose, K., & C. Andersen, 111

National Policy for Graduate Education

Allen, D., 91
American Council on Education, 149
Arlt, G., 179, 199
Association of American Universities, 185
Axt, R., 195
Bowen, H., 176
Carmichael, O., 93
Carnegie Commission on Higher Education, 185
Cartter, A., 201
Cartter, A., & R. Farrell, 141
Chemical and Engineering News, 186
The Chronicle of Higher Education, 202
The Commission on the Humanities, 186
Committee for the Survey of Chemistry, 109
Committee on Federal Laboratories, 188
Committee on Research in the Life Sciences, 206
Comptroller General of the United States, 161
Cooke, W., 64
Crowl, J., 177
DuBridge, L., 187
Economic Concerns Committee, 130
Engineering and Research Committee, 134
The Federal Interagency Committee on Education, 168
Froomkin, J., 174
Haggstrom, G., 128
Hall, W., 143
Handler, P., 188
Harris, S., 188
Haworth, L., 150
Heiss, A., 204
Higher Education and National Affairs, 189
Johnson, L., 150
Kerr, C., 13
Kidd, C., 117, 150
Lecht, L., 143
Legislative Reference Service of the Library of Congress, 23
Levien, R., 21
Magoun, H., 14, 197
Mayhew, L., 205
Miller, J., et al., 172
National Science Board, 138, 182
Office of Scientific Personnel, 189
Office of the Assistant Secretary for Planning and Evaluation, 192
Page, J., 111
Panel on Educational Innovation, 197
Panel on the Plant Sciences, 136
Peters, M., 157
President's Commission on Campus Unrest, 190
President's Science Advisory Committee, 193
Report of the President's Task Force on Science Policy, 191
Rivlin, A., 152
Ruggles, N., 112
Sanford, N., 67
Sawyer, R., 118
Scully, M., 207
Seaborg, G., 191
Shannon, J., 183
Smith, A., & J. Fischer, 113
Spurr, S., 100
Student Support Study Group, 169
Subcommittee on Science, Research, and Development, 192
Sullivan, R., 197
Taylor, H., 184
Thackrey, R., 22

U. S. Advisory Commission on International Educational and Cultural Affairs, 192
U. S. President's Science Advisory Committee, 193
Weaver, W., 208
Wilson, L., 194, 198
Wolk, R., 153
York, C., 153, 194

National Priorities

Boffey, P., 131
Dure, L., 133
Engineering Research Committee, 134
Harrar, J., 135
Harris, S., 188
Lecht, L., 136
National Manpower Policy Task Force, 137
National Science Board, 190
Weaver, W., 208

National Science Policy

Chemical and Engineering News, 186
Committee on Federal Laboratories, 188
Handler, P., 188
Legislative Reference Service of the Library of Congress, 23
National Science Board, 182, 190
President's Science Advisory Committee, 193
Report of the President's Task Force on Science Policy, 191
Shannon, J., 183
Subcommittee on Science, Research, and Development, 192
U. S. President's Science Advisory Committee, 193
York, C., 194

Planning, Financing, and Coordination of Graduate Education

Advisory Committee for Science Education to the National Science Board, 181
Advisory Committee on Governmental Programs in the Behavioral Sciences, 162
American Council on Education, 160
Arlt, G., 199
Association of American Universities, 185
Axt, R., 195
Bowen, H., 176
The Carnegie Commission on Higher Education, 185, 195
Cartter, A., 120, 146, 154, 155, 201
Cartter, A., & R. Farrell, 141
Chase, J., 27
Chemical and Engineering News, 186
The Chronicle of Higher Education, 202
Cohn, V., 186
Commission on Instructional Technology, 184
Commission on MIT Education, 179
Committee on Research in the Life Sciences, 206
Comptroller General of the United States, 161
Cooke, W., 64
Crowl, J., 177
Distler, T., 196
DuBridge, L., 187
Falk, C., 168
Farrell, R., & C. Andersen, 155
The Federal Interagency Committee on Education, 168
Fidler, W., 196
Firmin, P., et al., 156
Froomkin, J., 174
Hall, W., 135, 143
Handler, P., 180
Harcleroad, F., 196
Harris, S., 177
Haworth, L., 150
Higher Education and National Affairs, 189
Kelly, S., 181
Kidd, C., 150
Magoun, H., 197
Mayhew, L., 205
Millard, R., 205
Miller, J., et al., 172
Morison, R., 166
Morse, J., 162

National Science Board, 138, 182, 190
Office of Scientific Personnel, 189
Office of the Assistant Secretary for Planning and Evaluation, 192
Orlans, H., 163
Page, J., 111
Panel on Educational Innovation, 197
Panel on the Plant Sciences, 136
President's Science Advisory Committee, 193
Report of the President's Task Force on Science Policy, 191
Rivlin, A., 152
Russell, J., 152
Scully, M., 207
Seaborg, G., 191
Spurr, S., 71
Student Support Study Group, 169
Subcommittee on Science, Research, and Development, 192
Sullivan, R., 197
U. S. Advisory Commission on International Educational and Cultural Affairs, 192
U. S. President's Science Advisory Committee, 193
Weaver, W., 208
Wilson, L., 194, 198
Wolk, R., 153
York, C., 153, 194

Programs, Curricula, and Degrees

Adkisson, V., et al., 182
Advisory Committee for Science Education to the National Science Board, 181
Allen, D., 102
American Council on Education, 149
Arlt, G., 199
Axelrod, J., et al., 28
Carmichael, O., 93
The Carnegie Commission on Higher Education, 201
Cartter, A., 201
Cass, J., 44
The Chronicle of Higher Education, 202
Cohn, V., 186
Commission on Instructional Technology, 184
Commission on MIT Education, 179
Committee on Research in the Life Sciences, 206
Committee on the Student in Higher Education, 29
Cooke, W., 64
Dean, D., 180
Eckert, R., & R. Keller, 180
Falk, C., 122
The Federal Interagency Committee on Education, 168
Furniss, W., 107
Gardner, J., 203
Haggstrom, G., 128
Hall, W., 135
Handler, P., 188
Harcleroad, F., 196
Heiss, A., 53
Higher Education and National Affairs, 189
Jencks, C., & D. Riesman, 3
Lester, C., 204
Magoun, H., 124, 197
Mayhew, L., 4, 205
Miller, C., 4
Monson, C., 26
National Science Board, 138, 190
National Science Foundation, 124
Office of Scientific Personnel, 189
Office of the Assistant Secretary for Planning and Evaluation, 192
Peters, M., 157
Rees, M., 99
Roose, K., & C. Andersen, 111
Ruggles, N., 112
Schultz, J., 182
Scully, M., 207
Seaborg, G., & J. Barzun, 183
Shannon, J., 183
Taylor, H., 184
Tippo, O., 36
Union for Research and Experimentation in Higher Education, 71
U. S. Advisory Commission on International Educational and Cultural Affairs, 192
Valien, P., 49
Weaver, W., 208

Public Service

American Council on Education, 149
The Chronicle of Higher Education, 202
Handler, P., 188
Mayhew, L., 205
Weaver, W., 208

Purpose of the University

Bonner, J., 199
Bowen, H., 200
Corson, J., 56
Curle, A., 202
Dundonald, J., 11
Gardner, J., 203
Gross, E., & P. Grambsch, 86
Hartshorn, H., 45
Heyns, R., 204
Miller, J., 83
Odegaard, C., 207
President's Scientific Advisory Committee, 193
Rosenhaupt, H., 207
Western Interstate Commission for Higher Education, 84
Yegge, R., 208

Reforms and Changes in Graduate Education

Arlt, G., 198, 199
Axelrod, J., et al., 28
Brennan, M., 200
Caffrey, J., 200
The Carnegie Commission on Higher Education, 201
Cartter, A., 201
The Chronicle of Higher Education, 202
Committee on Research in the Life Sciences, 206
Curle, A., 202
Elberg, S., 30
Enarson, H., 30
Glenny, L., 203
Hart, F., 203
Hartshorn, H., 45
Heiss, A., 25, 204
Lester, C., 204
Mayhew, L., 205
Muscatine, C., 206
Nason, J., 206
Nichols, R., 54
Sanford, N., 35
Scully, M., 207
Sullivan, R., 197
Taylor, H., 36
Tippo, O., 36
Yegge, R., 208

Research

American Council on Education, 149
Axt, R., 195
Carnegie Commission on Higher Education, 185
Cunningham, D., 187
Engineering Research Committee, 134
Froomkin, J., 174
Haworth, L., 150
Higher Education and National Affairs, 189
Magoun, H., 197
Mayhew, L., 205
National Science Board, 138, 182, 190
President's Science Advisory Committee, 193
Report of the President's Task Force on Science Policy, 191
Seaborg, G., 191
Weaver, W., 208

● RESEARCH AND DEVELOPMENT FUNDING

Association of American Universities, 185
Babbidge, H., 149
Bock, R., 167
Carnegie Commission on Higher Education, 185
Committee for the Survey of Chemistry, 109
Froomkin, J., 174
Harris, S., et al., 65
Kidd, C., 117, 150
Lear, J., 151
Legislative Reference Service of the Library of Congress, 23
National Science Board, 138

National Science Foundation, 163
Orlans, H., 163
Sawyer, R., 118
York, C., 194

● RESEARCH
(Applied, Basic, Individual, Organized, and Sponsored)

Alciatore, R., & R. Eckert, 38
Alpert, D., 116
Axt, R., 195
Bonner, J., 199
Brennan, M., 200
Committee for the Survey of Chemistry, 109
Committee on Federal Laboratories, 59, 188
Committee on Physics and Society, 161
Committee on Research in the Life Sciences, 206
Cordozier, V., 94
Cunningham, D., 187
Harris, S., et al., 65
Heiss, A., 204
Henle, R., 116
Hobbs, W., & G. Anderson, 170
Kidd, C., 117
Lannholm, G., 90
Lear, J., 151
Morse, J., 162
National Science Foundation, 163
Office of Economic and Manpower Studies, 152
Orgel, S., & A. Zwerdling, 55
Orlans, H., 163
President's Science Advisory Committee, 193
Report of the President's Task Force on Science Policy, 191
Rossi, P., 70
Ruggles, N., 112
Russell, J., 152
Sanford, N., 67
Sawyer, R., 118

● RESEARCH ON STUDENTS

Alciatore, R., & R. Eckert, 38
Altbach, P., 28
Astin, A., 39
Bayer, A., & R. Boruch, 43
Beach, L., et al., 46
Brown, E., 29
The Chronicle of Higher Education, 202
Cieboter, F., 39
Committee on The Student in Higher Education, 29
Connor, J., 39
Elder, J., 40
Heiss, A., 31
House, J., 32
Keniston, K., 33
Lannholm, G., et al., 40
Lowry, H., 33
Manning, W., 40
Mehrabian, A., 41, 78
Nash, G., 41
National Center for Educational Statistics, 174
Nowlis, V., et al., 27
Office of Institutional Analysis, 43
Reilly, R., 42
Renetzky, A., 34
Rose, A., 47
Schatte, C., 42
Simpson, R., 47
Tippo, O., 36
Trow, M., & T. Hirschi, 37
Tucker, A., 37
Tucker, A., et al., 38

● SIZE OF INSTITUTIONS

Alexander, W., 62
Armytage, W., 7
The Chronicle of Higher Education, 202
Harris, S., 177
Heiss, A., 204
Nason, J., 206
National Science Board, 138
Orlans, H., 163

- STAFFING POLICIES OF INSTITUTIONS

Alpert, D., 116
Barzun, J., 1
Brown, D., 51
Council of Graduate Schools in the United States, 68
Dean, D., 180
Harrison, W., 65
Heiss, A., 204
Peters, M., 157
Schier, R., 55
Weaver, J., 71

- STANDARDIZATION OF FINANCIAL SUPPORT

Berelson, B., 92
Brandt, T., 167
Carnegie Commission on Higher Education, 185
Chase, J., 27
Comptroller General of the United States, 161
Farrell, R., & C. Andersen, 155
The Federal Interagency Committee on Education, 168
Lester, C., 170
Miller, J., et al., 172
Predmore, R., 172
Rhodes, H., et al., 164
Rivlin, A., 152
Student Support Study Group, 169
Walters, E., 101
York, C., 153

- STATE CONTROL OF INSTITUTIONS

Armytage, W., 7
The Chronicle of Higher Education, 202
Coons, A., 72
Eurich, A., et al., 64
Glenny, L., 73, 203
Graduate College News, 74
Harris, S., et al., 65
Heimberger, F., 74
Kerr, C., 56
Mayhew, L., 4
McConnell, T., 60
Rivlin, A., 152
Terman, F., & G. Reeling, 114
Wilson, L., 75

- STRUCTURE OF EDUCATIONAL INSTITUTIONS

Cluster Colleges

Benezet, L., 59
Gaff, J., & Associates, 60
Stewart, C. & J. Hartley, 158

Community and Junior Colleges

Axelrod, J., 62
The Chronicle of Higher Education, 202
Garrison, R., 51
Graduate College News, 74

Liberal Arts Colleges

Adkisson, V., et al., 182
Axelrod, J., 62
Baskin, S., 62
Bowdoin College, 63
Devane, W., 2
McGrath, E., 97
Stewart, B., 61

Professional Schools

Axelrod, J., 62
Muscatine, C., 206
Weaver, J., 71

Sectarian Colleges and Universities

Greeley, A., 65

State College Systems

Dunham, E., 73
Egerton, J., 73
Graduate College News, 74
King, J., 74

- STUDENT STIPENDS

American Council on Education, 149, 160
Cartter, A., 9
Chase, J., 173
The Chronicle of Higher Education, 167
Danforth News and Notes, 165
Division of Science Resources and Policy Studies, 170
The Federal Interagency Committee on Education, 168
Harmon, L., 165
Heim, P., & B. Bogard, 25
Hobbs, W., & G. Anderson, 170
Kidd, C., 150
Nash, G., 41
National Center for Educational Statistics, 174
Office of the Associate Director (Education), 172
Resources Analysis Branch, 48
Sims, A., 47
Student Support Study Group, 169
Taylor, D., 173
University of California, Los Angeles, 49
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Warkov, S., et al., 175
Woodrow Wilson National Fellowship Foundation, 166

- TEACHING versus RESEARCH

The Carnegie Foundation for the Advancement of Teaching, 127
Heiss, A., 25, 52, 53, 82
Kidd, C., 117
Muscatine, C., 206
Sawyer, R., 118
Smith, G., 17
Wilson, L., 81

- TENURE OF FACULTY

Barzun, J., 1
Brown, D., 51
Ingraham, M., 53

- TRENDS IN THE DEVELOPMENT OF GRADUATE EDUCATION

Allen, D., 91
Arlt, G., 5, 6, 103, 179, 198, 199
Armytage, W., 7
Aurbach, R., et al., 119
Axt, R., 195
Babbidge, H., 149
Barzun, J., 1
Beach, L., et al., 46
Berelson, B., 7, 8, 92
Bonner, J., 199
Bowdoin College, 63
Brown, E., 8
Carmichael, O., 93
The Carnegie Commission on Higher Education, 201
Carnegie Quarterly, 94
Cartter, A., 8, 9
Chase, J., 27
The Chronicle of Higher Education, 202
Coons, A., 72
Cordasco, F., 10
Corson, J., 56
Crawford, B., 10
Crowl, J., 177
Dearing, B., & G. Lederer, 10
DuBridge, L., 187
Dure, L., 133
Eells, W., 121
Feldmesser, R., 11
Ferris, A., 12
Folger, J., 129
The Goals Committee, 198
Graduate College News, 74
Haggstrom, G., 128
Hall, W., 135, 143
Hefferlin, J., 66
Heiss, A., 82
Higham, J., 12
Hofstadter, R., & W. Smith, 2
Holloway, J., 85
Horton, B., 12
Huganir, G., et al., 99
Jewett, J., et al., 108
Johnson, W., & F. Colligan, 162
Kerr, C., 13, 56
Kidd, C., 150
Knight, D., 67
Lecht, L., 143
Lester, C., 204
Magoun, H., 14, 197

Mayhew, L., 4, 14, 15
McGrath, E., 97
Miller, C., 4
Miller, J., 15
Muirhead, P., 16
National Science Foundation, 137
Page, J., 111
Perkins, J., 67
Rees, C., 16
Rees, M., 99
Reitz, J., 164
Rivlin, A., 152
Roose, K., & C. Andersen, 111
Rosenthal, E., 16
Rudolph, F., 17
Seaborg, G., 191
Shannon, J., 183
Smith, G., 17
Spurr, S., 100
Storr, R., 17
Strothmann, F., 18
Student Support Study Group, 169
Taylor, H. S., 22
Tickton, S., 159
Toynbee, A., 87
Valien, P., 49
Veysey, L., 5
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Walters, E., 101
Whaley, W., 18, 88
Wolk, R., 153
Young, F., 115

● UNEMPLOYMENT AND UNDEREMPLOYMENT

Barnes, A., 145
Boffey, P., 131, 145
Cartter, A., 120, 146
Chemical and Engineering News, 133, 146
Cooke, W., 64
Hall, W., 143
Higher Education and National Affairs, 147
Office of Economic and Manpower Studies, 148
Office of Scientific Personnel, 147
Pelczar, M., 125
Roethel, D., 159
Shapley, D., 148
Strassenburg, A., 139

● UNIVERSITY SUPPORT PROGRAMS (T.A.'s, R.A.'s, Fellowships, Loans)

Brandt, T., 167
Breneman, D., 154
Chase, J., 27, 173
Cohn, V., 186
Division of Science Resources and Policy Studies, 170
Folger, J., et al., 142
Graduate Record Examinations Board, 77
Hall, W., 135
Hobbs, W., & G. Anderson, 170
Jewett, J., et al., 108
Lester, C., 204
Miller, J., et al., 172
Monson, C., 26
National Center for Educational Statistics, 174
Nichols, R., 98
Nowlis, V., et al., 27
Office of Planning and Policy Studies, 171
Peters, M., 157
Russell, J., 152
Spurr, S., 71
Taylor, D., 173
Terman, F., 114
Terman, F., & G. Reeling, 114
University of California, Los Angeles, 49
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Warkov, S., et al., 175

● UNREST, ROLE OF

Administrators

Avorn, J., et al., 28
Fact-Finding Commission on Columbia Disturbances, 30
Katope, C., & P. Zolbrod, 33
Mayhew, L., 4
President's Commission on Campus Unrest, 190
Richard, R., et al., 34

Turner, J., 85
Vanderhoof, J., et al., 56

Faculty

Altbach, P., 28
Avorn, J., et al, 28
Brown, E., 29
Fact-Finding Commission on Columbia Disturbances, 30
Hart, F., 203
Heard, A., 52
Heiss, A., 52
Katope, C., & P. Zolbrod, 33
Lipset, S., & E. Ladd, 54
Logan, A., 54
Mayhew, L., 4
President's Commission on Campus Unrest, 190
Richard, R., et al., 34
Sanford, N., 35
Semas, P., 36
Skolnick, J., 34
Vanderhoof, J., et al., 56
Walsh, J., 160

Students

Avorn, J., et al., 28
Axelrod, J., et al., 28
Brown, E., 29
Cass, J., 44
Chase, J., 27
Coons, A., 72
Elberg, S., 30
Enarson, H., 30
Fact-Finding Commission on Columbia Disturbances, 30
Furniss, W., 107
Gordon, D., 31
Hart, F., 203
Katope, C., & P. Zolbrod, 33
Keniston, K., 33
Kerr, C., 56
Mayhew, L., 4, 14
Nichols, D., & O. Mills, 45
Richard, R., et al., 34
Sanchez, D., 35
Sanford, N., 35
Schultz, J., 182
Semas, P., 36
Skolnick, J., 34
Turner, J., 85
Vanderhoof, J., et al., 56
Yegge, R., 208

- UTILIZATION OF UNTAPPED RESOURCES (ABD's, Minority Groups, Women)

Beach, L., et al., 46
Bryant, J., 120
The Carnegie Commission on Higher Education, 195
Graham, P., 52
Lecht, L., 136
Nichols, D., & O. Mills, 45
Resources Analysis Branch, 48
Rose, A., 47
Smith, A., & J. Fischer, 113
WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Weaver, W., 208

- WOMEN (as Students, as Faculty)

Astin, H., 144, 145
Aurbach, R., et al., 119
Bureau of Labor Statistics, 126
The Chronicle of Higher Education, 202
Graham, P., 52
Lecht, L., 136
Resources Analysis Branch, 48
Science, 128
Smith, A., & J. Fischer, 113
Tickton, S., 140

H I S T O R Y A N D D E V E L O P M E N T

COLLEGES AND UNIVERSITIES

● Barzun, Jacques

The American University: How It Runs and Where It Is Going

Harper & Row, Publishers. New York. 1968.

Although Barzun ranges widely in his discussion, he primarily emphasizes the "New University" which emerged after World War II as the result of the Manhattan Project, the GI Bill, the New Deal, and many other pressures and forces that have influenced the development of the modern university today. The problems attending growth, rapid expansion, "bigness," the philosophy behind and the interaction of the various interest groups and constituencies upon the students, faculty, administrators, and society in general are presented and analyzed in terms of their present and potential impacts. Graduate work is criticized at length, not only in terms of the singular role it has, but also how it contributes to the ills of the current university. Twenty-three suggestions are offered to improve the university, apparently some with "tongue-in-cheek." He concludes that all of the pressure groups that impinge upon the university feel free to impose their ways on the university of which they know only a part; yet, if changes are to be made, including changes in the Ph.D., and if the university is to save itself by making these changes, "It must act not singly but in groups."

● Bullock, Henry Allen

A History of Negro Education in the South from 1619 to the Present

Harvard University Press. Cambridge, Massachusetts. 1967.

This book is a history of Negro education in the South, starting with "illegal" plantation schools to the 1954 Supreme Court ruling and beyond. This book primarily deals with the development of public school education for blacks, but does include a history of Negro colleges, both public and private. The author notes that although desegregation has been achieved by legislation, successful racial integration will come about only by socialization through programs such as Project Head Start and Upward Bound.

● Devane, William C.

The College of Liberal Arts

The Contemporary University: U.S.A. R. S. Morison, editor, Houghton Mifflin Company. Boston. 1-18. 1966.

The historical development, present status, types, and the future role of the liberal arts college are chronicled and discussed. It is concluded that the best hope for the future lies in the strong, private university colleges and independent colleges of long tradition.

● Flexner, Abraham

Universities: American, English, German

Oxford University Press. New York. 1968.

The volume expands three lectures originally given at Oxford in 1928, with additional data gathered in 1929-30, and a revision after extensive review by others in 1930. Flexner develops his ideas in four parts: the modern university, and those in America, Germany and England. Clark Kerr's introduction to the 1968 edition is as incisive and illuminating as the original book since it sets the volume in its proper perspective as a philosophical discussion of the university, rather than a treatise having a direct impact on the course of American higher education. Flexner thought that he was describing the ideal modern university, but in actuality he was writing the valedictory to a university which was already passing and evolving to a new form and stage. Flexner's predictions have been refuted and his one road to Mecca has been proved wrong--in contrast his main contributions (in another outlet) were in medical education and in goading other aspects to action.

● Hofstadter, Richard, and Wilson Smith, editors

American Higher Education: A Documentary History

Volumes 1 and 2. The University of Chicago Press. Chicago. 1961.

The book, published in two volumes, consists of an anthology of discussion about American higher education, and is a sampler of 300 years of a rich literature of educational discussion and controversy. It portrays with remarkable consistency the nature and structure of colleges and universities up to about 1960: the diffusion of the educational system throughout the country; the problems created by sectarian affiliations; the character and functions of presidents, trustees, and leaders of their times; the evaluation of curricular controversies and education ideas; roles of professors and conditions of their lives; and the development of academic freedom. Volume 1 consists of five parts and reviews the beginnings of American higher education from 1633 to the Civil War. Volume 2 begins with the sentiments and demands for a true university climaxing around 1850, the birth pangs of this movement prior to and following

the Civil War era, and concludes with the establishment of the true character of the modern American university stemming from the influence and progress of science and professionalism in the late nineteenth century.

● Jencks, Christopher, and David Riesman

The Academic Revolution

Doubleday & Company, Inc. Garden City, New York. 1968.

The authors trace the so-called "Academic Revolution" in American higher education (beginning with a general theory about the development of American colleges in relation to society), discuss different species of colleges and the forces that created them in relation to special interest groups, and evaluate their impacts on society. They envisage the major problem of the future as an intensifying conflict between the young and the old and the protests against the inequities of the system. They believe the rise to power of the academic profession, particularly special groups and subcultures within it, accounts for the academic revolution which has occurred, and that to some extent only two kinds of new colleges--the community and experimental--have been spawned by the revolution. The final chapter on reforming the graduate schools is especially pertinent because the graduate schools largely shape undergraduate education; it is here that possibilities for improvement exist. The challenge is to start at the top and to devise graduate programs and a new faculty life style that will bring about needed reform; the authors point out that changes will come from the dissidents within the graduate schools themselves and that the most likely source of trouble or cause for reform is generational conflict.

● Jencks, Christopher, and David Riesman

The American Negro College

Harvard Educational Review, Volume XXVII, 3-60, Winter, 1967.

In a comprehensive discussion the authors trace the history and development of Negroes in America, the evolution of the Negro colleges, their future in terms of the clientele from which they recruit, and the nature of the institutions presently existing or likely to develop. They point out that although there are important ideological and political differences between colleges founded to serve Negroes and those founded to serve white ethnic and religious minorities, Negro colleges today face many of the same dilemmas as these white institutions. Through racial and social integration, some traditionally Negro colleges will attempt to change by attracting white students and become indistinguishable from other institutions; others will remain predominantly black. Although some of the latter are likely to survive and still educate a high proportion of the Negro undergraduates, they are highly likely to remain academically inferior institutions. The authors suggest a more desirable, but less probable, alternative future for these Negro colleges which is discussed and analyzed in some detail.

- Mayhew, Lewis B.

  Colleges Today and Tomorrow

  Jossey-Bass, Inc., Publishers. San Francisco. 1969.

  Mayhew explores the evolution of higher education in the United States from its initial function as the doorway to the professions to its present state as the center of change in American society. The subject is viewed from a variety of perspectives, presented in 16 chapters, that focus on: functions and purposes; students, faculty and administration; the physical environment; curriculum and methods of instruction; protests, crises and challenges; and what the future holds. At the end of each chapter, after presenting and analyzing the problems, Mayhew suggests the conditions necessary for change and the steps to be taken to achieve them. Much attention is given to student unrest and the reform necessary for survival. The last two chapters review the developments of the last two decades and identify the internal and external forces that have shaped higher education at present; from these conditions the future to 1980 and 2000 is extrapolated and projected.

- Miller, Carroll L.

  Graduate Education in the Predominantly Negro Institution

  Proceedings of the Eighth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. San Francisco. 67-75. December, 1968.

  Carroll Miller of Howard University traces the history of graduate education in the predominantly Negro institutions: the framework in which it developed, the present status of this graduate education, and some reflections on the future. Such problems as adequate staffing, increasing enrollments and inadequate financing are discussed. Participation and cooperation with other institutions appear to be logical and necessary steps for the future.

- National Association of State Universities and Land-Grant Colleges. Office for Advancement of Public Negro Colleges

  Public Negro Colleges: A Fact Book

  Office for Advancement of Public Negro Colleges. Atlanta. July, 1969.

  This pamphlet discusses achievements of public Negro colleges. It gives a short history of their evolution from post-Civil War secondary schools to teacher colleges. The potential and the problems of these institutions are stressed, including the financial problems: 50% of their funds come from state legislatures, and there is a drain of their competent faculty by larger bi-racial universities. The Office for Advancement of Public Negro Colleges feels that in the future the schools will have to serve more than one race and that they have a role in American higher education.

● Oliver, W. H.

A Society and Its Universities: The Case of New Zealand

The New University. John Lawlor, editor. Columbia University Press. New York. 157-195. 1968.

Oliver reviews and evaluates the forces and pressures that have shaped the universities in New Zealand: financial stringency, social demand, academic demand, and ideological reorientation. Since World War II the social demands for higher education and the academic demand for higher standards have played dominant roles, but the inflexible system of government financing, the economic status and public opposition against high spending mitigate against improvement and reform.

● Veysey, Laurence R.

The Emergence of the American University

University of Chicago Press. Chicago. 1965.

This study was originally prepared as a doctoral dissertation in history at the University of California at Berkeley in 1961. It is presented in two major parts: "Rival Conceptions of the Higher Learning 1865-1910" and the "Price of Structure, 1890-1910," each with a number of pertinent chapters and subsections. Overall it conceptualizes the history of American higher education up to the early 20th century, emergence of the domesticated American university as opposed to the German prototype, and education of the masses as opposed to education for the few. The personalities of the men largely responsible for the American university development are woven into the discussion of the growth of the individual universities that sustained them.

INFLUENCE AND TRENDS

● Arlt, Gustave O.

Graduate Education

Encyclopedia of Educational Research. Fourth Edition. Robert L. Ebel, et al., editors. The Macmillan Company. New York. 544-551. 1969.

This article traces the history and phenomenal growth of graduate education in the United States from its beginnings to the present time. Starting with the granting of the first Ph.D. in 1861 by Yale University, the pioneering role, development and contributions of other graduate schools are described. The internal structure and organization of the graduate school--the role of the graduate dean and graduate council in establishing and directing programs, the requirements for master's and Ph.D. degrees, and the role of research including postdoctoral study in the graduate school--are discussed. The national coordination of graduate work through AAU, AGS, and CGS are described. The growth

of graduate education is illustrated by the increase in the number of institutions offering the doctorate from less than 50 in 1900 to 227 in 595 fields in 1965.

● Arlt, Gustave O.

New Trends in Graduate Study in the Humanities

Graduate Education Today. Everett Walters, editor. American Council on Education. Washington, D. C. 185-201. 1965.

Arlt reviews the history and development of the humanities in the American university. Although encouraging signs of progress are evident, Arlt sees much uncertainty, insecurity, a sense of futility, and a defensive attitude pervading and influencing the current status of the humanities. The development of individual fields and their interaction culminating in the establishment of the National Humanities Foundation and the later creation of the National Endowment for the Humanities are traced and discussed. The author concludes that when the humanist recognizes, faces and lives up to the basic responsibilities--to give purpose and direction to society and civilization--only then will the humanities regain their rightful place and leadership.

● Arlt, Gustave O.

Perspective

Proceedings Twelfth Annual Meeting. Western Association of Graduate Schools. Seattle. 2-12. March, 1970.

Arlt contends that graduate education has always sought to view things in their true relations and relative importance and he cites various efforts made in the last 15 years by learned societies, education associations and individual universities to improve graduate education. He reviews and discusses the intermediate and master's degrees and concludes that the master's will be replaced by the M.Phil. He also endorses the Doctor of Arts degree, if properly used, as an alternative to the Ph.D. and the Candidate in Philosophy degrees.

● Arlt, Gustave O.

Review of Graduate Education and Efforts to Improve It

Report of the Conference on Predoctoral Education in the United States. Office of Scientific Personnel, National Research Council. Washington, D. C. 1-8. November, 1969.

Arlt's background paper, given at the Woods Hole Conference in 1969, reviews much of the historical development of graduate education in the United States and cites many of the salient benchmarks characterizing and influencing significant changes. "Much of the literature since 1900 is a criticism of the ills that still plague us; little was done about reform, but this will come,

indeed it is already upon us." Outstanding efforts to improve graduate education during the last 15 years are described: the Snell Study of graduate education for historians in 1956 (1962 Report); the Modern Language Association Study of the Ph.D. in English and American Literature by Allen, published in 1968; the Council of Graduate Schools-National Endowment for the Humanities Study to improve graduate education in the humanities (now in progress); AAC-CGS Study of College Teaching from 1965-1970; and other innovations at individual universities (Cornell's six-year doctorate, Yale's M.Phil., D.A. at Carnegie-Mellon and elsewhere, and the Candidates degree in Big Ten and in California).

● Armytage, W. H. G.

Thoughts after Robbins

The New University. John Lawlor, editor. Columbia University Press. New York. 77-100. 1968.

Armytage traces the proposals and the changes that resulted from the Robbins Report on higher education in England and the recommendations that preceded it. The Robbins Report is not considered revolutionary since proposals made as early as 1956 and 1963 encouraged the expansion of higher education, the use of the resources of under-privileged and industrial areas, the use of part-time teachers, more training of girls especially for teaching, and polytechnic education. Further recognition of equal performance meriting equal academic award appeared in the Robbins Report which encouraged degrees for degree work in nondegree granting schools; even greater growth occurred than Robbins predicted as the report based its figures on demands for university places rather than on the manpower needs of the economy. Studies of educational development were initiated by Robbins, and the statistical service in planning the growth of education was probably the most important contribution of the Robbins Report.

● Berelson, Bernard

The Studies of Graduate Education

Proceedings of the Fourteenth Annual Meeting of the Midwest Conference on Graduate Study and Research. D. R. Clippinger, editor. The Midwest Graduate Study and Research Foundation Incorporated. Chicago. 34-48. March, 1958.

Berelson prepared this paper for presentation at a 1958 conference; published in book form in 1960, it is now considered to be a classical study of the background, development, landmarks, and review of literature pertaining to graduate education. Debate and discussion over the problems and issues of graduate education are noted as being constant throughout literature of the field, and 35 important reports and pronouncements on this subject are identified. Ten criticisms, considered by the author to be the most valid, are treated in detail. Berelson feels that the continuing discussion and debate over graduate education are constructive in that they help in containing the system's tension and in working toward periods of delicately balanced

equilibrium. He concludes that changes in graduate education will be slow due to its size, diversity and complexity.

● Berelson, Bernard

What Should Be the Direction of Graduate Education?

Current Issues in Higher Education 1959. G. Kerry Smith, editor. National Education Association of the United States. Washington, D. C. 150-154. 1959.

Berelson offers criticisms of graduate education: intellectual capability should be the prime criterion for admissions not personality; the graduate schools should not train the Ph.D.'s how to teach, his employer should; and it is not practical in time or money to teach both breadth and depth. He also discusses two current reform proposals: the idea of a teaching degree has been around for thirty years but colleges want to hire Ph.D.'s, and it is not possible to revive the master's degree because it has become the kiss-off degree. The author also discusses the effects of government fellowships and distribution of talented students. He believes it is better to fill the good institutions before expanding the others. The public institutions will gain ground in the long run.

● Brown, Edmund G.

Public Higher Education in California

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 104-109. 1965.

The author, former Governor of California, describes the California Higher Education System: its initiation and expansion on the basis of population projections and a master plan, and the theory of free education and support by California taxpayers. The system provides that the top 12% of high school graduates may attend one of the universities; the top 1/3, one of the state colleges; and the rest, one of the junior colleges.

● Cartter, Allan M.

All Sail and No Anchor

American Scientist, Volume LIX, No. 2, 178-182, March-April, 1971.

In a slightly revised version of his Phi Beta Kappa-Sigma Xi lecture presented at the 1970 meeting of AAAS, Cartter outlines the forces affecting institutions of higher education and suggests the possible course these may take in the 1970's. Colleges and universities are in a period of marked change--in curricula, teaching methods, educational aspirations, structure, and governance. Cartter believes that assorted stresses and strains--student discontent, faculty concerned only with their professional career paths, the inroads of inflation, possible unionization, a depressed marketplace for

Ph.D.'s, and a possible overexpansion of higher education by the 1980's--are the current circumstances which will sharply alter higher education in a revolutionary manner during the next 15 years. Yet, Cartter sees the traditional college and university performing the same functions they have performed in the past for 80% of the undergraduates at least 80% of the time, and for perhaps 90% of graduate students 90% of the time--but in a more serious and effective way.

● Cartter, Allan M.

An Assessment of Quality in Graduate Education

American Council on Education. Washington, D. C. 1966.

This is the well-known and often quoted subjective study of quality in graduate education, involving 29 disciplines in 106 universities, conducted under the sponsorship of ACE and published in 1966. An 80% response to the questionnaire, which rated both the faculty and the departmental programs, was received; the results, given by disciplines, are contrasted with a summary of the previous studies performed. Pertinent findings are that the number of Ph.D.'s on faculties had improved since the 1950's and that our graduate schools possess the capacity to meet adequately the expanding need for Ph.D.'s--hence the prediction of a shortage in the coming decade is wrong.

● Cartter, Allan M.

The Decades Ahead: Trends and Problems

Graduate Education Today. Everett Walters, editor. American Council on Education. Washington, D. C. 223-246. 1965.

Cartter, in attempting to project the future of graduate education, admits that the only safe prediction is for great change. Since World War II the graduate school has become the center of the university and its problems. Between 1965 and 1980 the supply of potential graduate students will triple, with science, interdisciplinary fields and education growing fastest. This expansion will create problems: in admissions, a centralized admission service could help graduate schools handle the projected five- to ten-fold increase in applications; to supply the faculty necessary to produce Ph.D.'s, better methods of estimating needs are essential; imbalance in Federal and industrial support in favor of the sciences and centered in relatively few schools will decrease slightly, but the basic trend will continue, and institutions themselves should be prepared to compensate with their own resources. As quality decreases with the center of graduate education shifting to public institutions and high-quality schools producing a smaller percentage of total Ph.D.'s, increasing pressure for better evaluation will probably not force formal accreditation, but encourage increased evaluation of programs and degrees, with AGS and CGS exercising an important role in watching standards.

● Cordasco, Francesco

Daniel Coit Gilman and The Protean Ph.D.

E. J. Brill, Publishers. Leiden, Netherlands. 1960.

This is a critical analysis of a great American educational leader and his role in pioneering graduate education in the United States. It details Gilman's training and experiences and the great influence he exerted upon other great leaders and institutions of his day. Under Gilman, Johns Hopkins (1875-1902) fulfilled a half century of the aspirations of American graduate education; it was the culmination of his educational career, not the beginning, and it grew out of his experiences at Yale, California and Europe. Johns Hopkins was structured only in part on the German model; Gilman rejected the German orientation and developed the protean Hopkins Ph.D. based on the Yale Ph.D. The Hopkins Ph.D. became the prototype of the American academic world: defining minimal residence, foreign language requirements, seminars, thesis, and the oral examination. The Ph.D. of Gilman's world answered the needs of 19th century America and led to the modern American university built around the graduate school--yet he would be the first to advocate its need to adjust with change, and did so in many of his talks and writings.

● Crawford, Bryce

New Trends in Graduate Study in the Physical Sciences

Graduate Education Today. Everett Walters, editor. American Council on Education. Washington, D. C. 216-222. 1965.

Crawford sees no imbalance between the physical sciences and other areas. The production of doctoral degrees in the EMP area, although large in actual numbers, shows no distortion in percentage of increase over the last three decades. Advances in the physical sciences have brought about the interest of society, as theory has become reality, but the universities should not, and have not, become distorted by society's or government's preoccupation with science. There has been a great change in graduate study in engineering, and some engineering programs are difficult to distinguish from similar ones in the sciences. The EMP fields will continue to change and graduate programs should follow the new directions.

● Dearing, Bruce, and G. Peter Lederer

Trends in Graduate Education

American Education, Volume IV, 6-7, February, 1968.

This article describes the problems of the universities, particularly the graduate schools, in the wake of rising enrollments and costs. It discusses the devaluation of the B.A. and the rising importance of the master's and Ph.D. degrees to qualify for positions formerly requiring lesser degrees. The role of the graduate dean is described as taking one of three patterns:

the distinguished scholar attracting grants and students, a clerk with little authority over departments, or a strong dean with his own budget and control of graduate programs and research. Arguments for and against the language requirements for the Ph.D. are reviewed.

● Dundonald, James

Advice to an Alderman

The New University. John Lawlor, editor. Columbia University Press. New York. 101-126. 1968.

Dundonald critiques the expansion and planning of the university system in England, offers advice on what he thinks the new institutions should be, and suggests that the hostility existing between administrators and faculty in American schools is a coming trend in English schools unless corrective steps are taken. He suggests: student involvement in university government, the primacy of the teaching function, a common-core studies curriculum centered in the sciences, and a constant scrutiny of standards.

● Feldmesser, Robert A.

Problems and Issues in the Future of Graduate Education

Report prepared for the Graduate Record Examinations Board. Educational Testing Service. Princeton, New Jersey. January, 1971.

The Graduate Record Examinations Board commissioned Feldmesser and associates at ETS to conduct a survey of the future problems and issues facing graduate education by means of a conference, interviews, and review of the literature. Important findings noted were: both funds and traditional job opportunities are becoming scarcer; the purposes and requirements of graduate education are being seriously challenged with demands for greater attention to the teaching functions of the Ph.D. and the application of his knowledge in the amelioration of social problems; also, of the many possible alternatives offered as solutions to the manifold problems, there appears little sufficient basis of adopting any of them with confidence. The authors recommended a series of "Colloquia on Graduate Education" be initiated to stimulate intensive exploration of problems and solutions and to assist graduate departments in making a closer examination of their educational problems and practices.

● Ferriss, Abbott L.

Indicators of Trends in American Education

Russell Sage Foundation. New York. 1969.

Ferriss, in this book, has undertaken the task of assessing data from a variety of Federal and other statistical agencies by assembling, collating and analyzing data as they bear on trends in American education. He has approached the subject from the overall viewpoint of education in general and the eight chapters and appendices in this book center around enrollment, teachers, quality of education, graduates or production from the system, trends in organization and finance, educational attainment measured by various criteria, and finally the attainment of society's goals for education. There is a large amount of pertinent and statistical data applicable to graduate education in each chapter.

● Higham, John

The Schism in American Scholarship

The American Historical Review, Volume LXXII, No. 1, 1-21, October, 1966.

This pamphlet deals with the evolution of divisions in learning; the split off of natural sciences from humanities, and finally the split of social sciences into a discipline of its own. The rise of the natural sciences in the United States was faster than in England where the class system existed and was perpetuated. Through support available, the National Science Foundation probably stimulated the social sciences to become separated and caused them to align with the natural sciences.

● Horton, Byrne J.

The Graduate School: Its Origin and Administrative Development

New York University. New York. 1940.

This volume sets forth the administrative principles and policies of the American graduate school as historically developed up until 1940; many of the historical events and their influence have been reviewed elsewhere. The evolution of organized graduate schools in three discernible stages in America is traced: the missionary period prior to establishment of Johns Hopkins University (Revolutionary War to Civil War), the formative period starting with Johns Hopkins to the establishment of the graduate school at Brown (1876-1927), and the period of evaluation and progress (1927-1940) characterized by expansion of the state universities.

● Kerr, Clark

Toward a Nationwide System of Higher Education?

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 258-262. 1965.

Kerr discusses his views on the creation or emergence of a national system of higher education and states that although the trends favor this eventual development it will not happen in the foreseeable future. One trend is support by the Federal government for education, as education and society are mutually dependent; however, forces of autonomy for the university are strong and increasing, and he feels a nationwide system would be too unwieldy and that the Federal government has no desire to take over. Voluntary consortia will soon result, and the emerging system of education will have a pluralistic control which is a reflection of United States society itself.

● Kerr, Clark

The Uses of the University

Harper Torch Books, The Academic Library, Harper & Row, Publishers. New York. 1966.

The volume, based on the Godkin Lectures delivered at Harvard University in 1963, describes and evaluates some of the significant developments in American higher education. Three main topics are reviewed: "The Idea of a Multiuniversity," "The Realities of a Federal Grant University," and "The Future City of Intellect." The histories of higher education and graduate work are inevitably interwoven into the discussion of the major chapters. Evolution of the American university and its historical roots are described succinctly as first being "a village with its priests (a community of masters and scholars)," transformed in time into "a one-industry town (modern university) with its intellectual oligarchy," and evolving today to "the 'multiuniversity' (a whole series of communities and activities) interacting with the surrounding society and emulating it." The university has become the "Federal grant university" molded by two impacts into its current distinctive nature: firstly by the Morrill Act of 1862, and secondly by Federal support of scientific research during and following World War II. After conceding that Federal support has made the multiuniversity what it is today, Kerr makes eight suggestions concerning Federal support. The final form of the true American university to emerge in the future is envisioned by Kerr as one composed of an entirely new complex, and dominated by four major systems: Eastern, Western, Midwestern, and South-Southwestern. Three great areas of concern, and their related adjustments, currently facing all universities are growth, shifting academic emphases, and involvement in the life of society--in addition, they must face the urgent issue of how to preserve a margin of excellence in a populist society.

● Magoun, H. W.

The Cartter Report on Quality in Graduate Education

The Journal of Higher Education, Volume XXXVII, No. 9, 481-492, December, 1966.

The standings of the leading institutions are discussed and rated with the top, upper middle, lower middle, and lower clusters as categories. The University of California, Berkeley appears in the leading group in all five divisions, supporting its claim as the best balanced distinguished university in the United States. The report notes a failure in the development of new graduate centers as critical. In 1920, ten schools produced 2/3's of the Ph.D.'s; in 1940, Ph.D. production had spread to 25; but in 1960, only five universities had advanced to the ranks of the top 20. More action is needed by groups that support the interest of institutions in years ahead--particularly support for research to strengthen and develop excellence in more schools at the Federal level.

● Magoun, H. W.

Doctoral Study in California Institutions

Graduate Division, University of California, Los Angeles. September, 1968. (Mimeographed.)

Magoun analyzes and discusses the NAS-NRC publication "Doctorate Recipients from United States Universities 1958-1966" published in 1967 in terms of the California institutions. He concludes: that institutions in California awarded 10% of the nation's Ph.D.'s in this period, and four were included in the top 40 universities; slightly less than one-half of California's B.A. graduates left the state for graduate work; the out-of-state doctorates migrating to California equaled the California doctorates remaining in California; and half of the doctorates awarded by California schools were in the natural sciences and engineering, and 1/3 were in the social sciences and humanities.

● Mayhew, Lewis B.

American Higher Education and Social Change

Higher Education in the Revolutionary Decades. Lewis B. Mayhew, editor. McCutchan Publishing Corporation. Berkeley. 3-10. 1967.

Mayhew's essay sums up the changes in education since World War II. Education has managed to meet the heavy demands for service and has not only survived but prospered. To meet the enrollment needs, the quality of education was diluted but the graduate schools responded by enlarging their capacities and producing adequate numbers of Ph.D.'s for the teaching responsibilities. Financing of higher education has radically changed with the growth of Federal aid, and yet outright Federal control feared by the institutions

has not materialized. Students have changed largely to become more activistic and higher education has responded to their charges of noninvolvement. The author sees Federal aid continuing for higher education but only if the institutions offer programs of educational relevance and rise to meet the needs of a rapidly changing society. Mayhew forecasts that 80% of the college age youth will be enrolled in colleges in 1980.

● Mayhew, Lewis B., editor

Higher Education in the Revolutionary Decades

McCutchan Publishing Corporation. Berkeley. 1967.

This book is a series of essays selected by the editor, Lewis B. Mayhew, to illustrate and develop the general thesis that the period since 1945 is one of the most revolutionary in history. The purpose of the anthology is to indicate the nature of the revolution, how higher education has already changed, the problems which remain to be solved, and the possible future. Some topics the essays deal with are the affluent society, problems of disadvantaged groups, accelerating technological change, university growth and quality, student unrest and suggestions for the future role of education.

● Miller, John Perry

New Trends in Graduate Study in the Social Sciences

Graduate Education Today. Everett Walters, editor. American Council on Education. Washington, D. C. 171-184. 1965.

This article discusses the dramatic changes that have occurred in graduate training and research in the social sciences in the past 30 years. These changes reflect several developments including new disciplines and subdisciplines, such as econometrics, and the increasing demand for social scientists, particularly in nonacademic careers. Another problem described is that although social sciences derived from the humanities, they are now taking on the characteristics of the physical and natural sciences, i.e., use of computers and quantitative methods. The article includes statistics of Ph.D.'s awarded in the social sciences from 1930-1960, which increased an average of 470%; the increases by field were: anthropology--840%, psychology--740%, political science--520%, sociology--400%, economics--350%, and history--300%. SSRC has played a major role in stimulating and supporting innovations.

● Muirhead, Peter P.

Trends in Federal Aid to Higher Education

Report of a Legislative Work Conference on Higher Education. Western Interstate Commission for Higher Education. Boulder, Colorado. 59-62. February, 1970.

In this address given at the Legislative Work Conference on Higher Education sponsored by the Western Interstate Commission on Higher Education, Muirhead presents trends in higher education: in the sixties, enrollments and the awareness of the social responsibility of colleges and universities grew; the increased education of the labor force has resulted in increased economic growth; Federal support is important to education, but institutional autonomy should be preserved; equality of opportunity was emphasized by increased work-study programs; and landmark legislation on education during the last decade has received support from both parties.

● Rees, Carl John

Graduate Education in the Land-Grant Colleges and Universities

Association of State Universities and Land-Grant Colleges. Washington, D. C. 1962.

Rees summarizes the history of graduate education in the land-grant colleges and universities, institutions whose original purpose was the study of agriculture. Agriculture as the field of the first graduate work in these schools was stimulated by the agricultural experiment stations and spread among the land-grant institutions and into many other fields. The lack of AAU membership for most of these schools brought about the creation of their own organization, The Association of Land-Grant Colleges and Universities, and within it a Graduate Council, which is not a policy establishing body.

● Rosenthal, Elsa

Some Current Issues in Graduate Education: A Review of the Literature 1965-1970

Prepared for Graduate Record Examinations Board. Educational Testing Service. Princeton, New Jersey. January, 1971. (Mimeographed.)

Prepared as a companion piece to Feldmesser's Report for the GREB, this incisive and well-written review summarizes the recent literature pertaining to graduate education. A bibliography of over 90 key sources is cited or consulted in highlighting the current problems facing graduate education as seen by eminent leaders and commentators; it makes no pretense of being a comprehensive review or a documentation of the wealth of articles, the plethora of issues or problems raised or the divergence of views expressed or published widely in the last five years.

● Rudolph, Frederick

The American College and University: A History

Vintage Books, Random House. New York. 1962.

This book is intended to give some sense of the historical understanding of the questions of how and why and with what consequences the American colleges and universities developed as they have. Rudolph develops this perspective by starting with the colonial colleges and how various factors, including financing, shaped the early American institutions up to the Civil War--which heralded the dawning of a new era eventually resulting in the emerging university. Other forces and aspects up to World War II are reviewed. The epilogue treats the major forces and events occurring after World War II--the era of university growth and rationalization was over and new problems and questions awaited definition and answers. Although current problems appear large, they are no larger than those of the early nineteenth century. Much of the early history, evolutionary developments, and current day events is reviewed in other publications and documents.

● Smith, G. Kerry, editor

Twenty-five Years: 1945-1970

Jossey-Bass Inc., Publishers. San Francisco. 1970.

This book is a collection of essays by over 30 leading spokesmen of higher education during the last 25 years published in the yearbooks of the AAHE, "Current Issues in Higher Education." Besides being a historical recitation, it presents issues and problems pertinent to the past, today and tomorrow. The prologue by Axelrod and Freedman and the epilogue by Mayhew summarize the major topics and issues of the last 25 years (e.g., the atomic age, the impact of the GI student, McCarthyism, civil rights, Sputnik, NDEA, protests--Berkeley and Viet Nam) and project the future based on these observations and trends. Relevance and the call for reform run through most of the papers, particularly after 1960. In general, the authors feel that progress is being made and higher education is beginning to respond to the myriad of dissatisfactions, but much still remains to be done in closing the credibility gap.

● Storr, R. J.

The Beginnings of Graduate Education in America

University of Chicago Press. Chicago. 1953.

The book reviews the salient features and events leading to the origin and evolution of modern graduate schools of arts and sciences in their institutionalized forms. Roles of men and schools are stressed, starting with the pre-Civil War history and the long evolution to the modern period. Many contemporary reviews and historical treatises draw heavily upon this book and the reference sources cited. Eleven chapters deal with important events and

periods, starting with the American college antecedents and their shortcomings, and ending with the early tradition of graduate education. The important benchmarks, events, and influences between are stressed. An extensive bibliography and notes end the chapters and the topics discussed are documented in detail.

● Strothmann, Friedrich Wilhelm, editor

The Graduate School Today and Tomorrow

The Committee of Fifteen. Fund for the Advancement of Education. New York. 1955.

This history of the graduate school, compiled in 1954, is much outdated in light of subsequent developments and it regurgitates the traditional criticisms of graduate education--too much emphasis on research, neglect of the teaching role and humane scholarship, etc. Many of its predictions for the future have been proved incorrect and the recommendations largely reflect the committee's background in the humanities and social fields and focus on better preparation for teaching.

● Whaley, W. Gordon

New Trends in Graduate Study in the Biological Sciences

Graduate Education Today. Everett Walters, editor. American Council on Education. Washington, D. C. 202-215. 1965.

This essay contrasts past and present biologists and their training. The trends in the biological sciences are toward specialization, problem solving, students who are more dedicated and imaginative, and greater interrelationships between the biological and physical sciences.

ORGANIZATIONS: ACADEMIC/GOVERNMENTAL/QUASI-GOVERNMENTAL

● Anderson, Robert C.

The Southern Regional Education Board

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 190-195. 1965.

This essay is a description of the highly successful Southern Regional Education Board. The power lies in the Board which includes the Governors, educators, and members of the legislatures of the various states. The Board is an agency of the states, not of the universities, and as such has contract powers and power for overall planning. It has been more powerful than other regional agencies such as WICHE and NEBHE.

● Arlt, Gustave O.

Three Years, 286 Days: The Birth of a National Foundation

The Graduate Journal, Volume VII, No. 2, 461-475, Spring, 1967.

This article is a chronicle of the events culminating in the establishment of the National Foundation on the Arts and Humanities. The five-year period from 1960 until 1965 was one filled with many proposals, suggestions, victories and defeats. The decision whether to form an independent foundation or one to be housed under an already existing agency was finally resolved toward the establishing of an independent agency. As finally approved, the Foundation is divided into two Endowments, each headed by a chairman with a 26 member council appointed by the President. There is an overall Federal Council on the Arts and Humanities consisting of seven ex-officio members which coordinates the two Endowments. The National Endowment for the Arts concerns itself with promotion and support through fellowships, scholarships, and grants of all artistic endeavor, both creative and performing, on the professional or semiprofessional level. The National Endowment for the Humanities concerns itself with the realm of organized education and its purposes are stated in broad terms to give wide latitude to the chairman and council. Public Law 89-209 proposed funding at $10 million a year for each of three years divided equally between the two Endowments; although this may seem small, the National Science Foundation received only $3 million in its first year of operation.

● Bates, Ralph S.

Scientific Societies in the United States

Third Edition. Massachusetts Institute of Technology Press. Cambridge, Massachusetts. 1965.

Bates traces the history, background, birth, and growth of U. S. scientific societies and their impact in shaping science and national policies from their inception in 1727 to the present (1965). The progression has been from the lone scientist to the combined efforts of the university, industry and government research team to national and international projects. Scientific societies have always been a powerful force in advancing the front of science, particularly in times of crisis. The total number of active, vital societies existing in 1965 probably exceeded several thousand, depending on the definitions and bases used.

● Bohnenblust, H. Frederic, John L. Landgraf, and John A. Winterbottom

Committee Report on the Graduate Record Examinations Board

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 7-20. December, 1967.

Landgraf discusses the history, formation, objectives, and accomplishments of the Graduate Record Examinations Board since 1965. Bohnenblust reviews the Advanced GRE Tests as to their purpose, use, interpretation of scores, and future plans. Winterbottom presents the history and development of the Graduate School Foreign Language Testing Program, the design, usage and problems of the tests, and future plans--all under the purview of the GREB.

● England, J. Merton

Interesting Times--The NSF since 1950

Mosaic, Volume I, No. 1, 3-7, Winter, 1970.

England reviews the salient historical developments leading to the creation of the National Science Foundation, the original purposes and goals for which it was established, the factors and events that have forged and modified its aims and evolution, and its accomplishments and role in shaping changes during the last twenty years. The central activities of NSF to date have been two-fold: supporting basic research in nonprofit organizations and the development of scientific talent through educational programs in the sciences--various ramifications of these functions have emerged in different forms and programs. Entering its third decade, now under the direction of W. D. McElroy, current trends suggest that NSF's programs today and in the future will be different in kind and balance, i.e., expanding support of the social sciences, sponsorship of applied and interdisciplinary research, international cooperation, and the development of computers and data collection.

● Kroepsch, Robert H., and M. Stephen Kaplan

Interstate Cooperation and Coordination in Higher Education

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 174-190. 1965.

The authors trace the evolution of interstate or regional cooperation in education and in particular discuss the large regional organizations--SREB, WICHE and NEBHE (Southern Regional Education Board, Western Interstate Commission for Higher Education and New England Board of Higher Education) with the growth of student enrollment and regional problems. Each board or commission was established because of the need to reduce duplication, improve instruction, update facilities, avoid competition, and supplement and coor-

dinate services and exchange of students. Although generally similar in purpose, each organization is different and functions vary because of the differences in the areas, problems and types of institutions served. In general, in addition to coordinating activities, they survey needs and shortages, create workshops, and generally assist the schools involved, particularly in medicine and dentistry.

- Levien, Roger E.

  National Institute of Education: Preliminary Plan for the Proposed Institute

  The Rand Corporation. Washington, D. C. December 15, 1970.

  The document summarizes the results of the first six months' effort in planning the proposed National Institute of Education. It presents the proposed objectives, program, organization, and the network of relationships of the NIE from President Nixon's proposal for its creation in March 1970, through subsequent discussions and modifications by various groups and commissions, to issuance of the Planning-Study Report by the Rand Corporation.

- National Academy of Sciences

  National Academy of Sciences

  National Academy of Sciences. Washington, D. C. 1969.

  This booklet describes the complex history and development of the NAS-NRC-NAE, what they are and what they do. NAS was founded in 1863 by the Act of Congress as an advisory group to government; its membership elected annually presently consists of about 850 scientists. The NRC was created in 1918 as the action arm of the NAS; NAE was established in 1964, autonomous and parallel, but coordinated with the NAS. Examples are cited of advisory services, accomplishments, and interactions with the scientific community, the government, education and research. The pattern for NAS-NRC-NAE in the future is more interdisciplinary orientation and involvement in the broadly based problems of society, resulting from and created by science.

- Selden, William K.

  The Association of American Universities: An Enigma in Higher Education--A Charmed Circle?

  The Graduate Journal, Volume VIII, No. 1, 199-209, 1968.

  Selden discusses the history, evolution and problems of the AAU since its birth in 1900 and likens its origin and development to a three-act play on the stage of higher education. Act I, from 1900-1914, is characterized as the formative years; Act II, spanning the years 1914 to 1948 is described as the period of expansion; and 1948 to the present constitutes Act III--which spawned AGS and brought the membership of AAU to 44. Selden concludes

that AAU, in a sense, has become a symbol--an elite, exclusive club. It is no longer a standardizing or accrediting organization, nor a sponsor of research studies, but a club where the presidents meet twice a year to exchange views and share common interests. The AGS largely continues AAU's original purpose, which is in part now shared by CGS, a more broadly representative group of graduate schools created in 1961 in part with AGS sponsorship.

● Taylor, Sir Hugh S.

The Philanthropic Foundations and Graduate Education

Support of Graduate Education in an Enlightened Society. Cornell University. Ithaca, New York. 17-29. 1960.

In his address, Taylor refutes the idea that intellect is at the mercy of philanthropy. Enormous benefits to individuals, universities and nations have resulted from philanthropic foundations' concern with graduate education; outstanding examples from 19th century Europe are cited to illustrate the evolution of this relationship. His attention turns to the United States in the discussion of 20th century philanthropy: noting the achievements of recipients of NRC Postdoctoral Fellowships and Rockefeller Foundation awards; reviewing the establishment of the Woodrow Wilson National Fellowship Foundation and pointing out that NDEA and Title IV Programs are successors to the patterns and objectives of that program; and stressing these earlier programs as precursors of present patterns of Federal support and programs--such as NSF's programs stemming from the NRC programs. Taylor feels there is still a need for bold experiments and for foundations with the freedom and wisdom to make pioneer efforts.

● Thackrey, Russell I.

National Organization in Higher Education

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 236-249. 1965.

The author relates the myriad growth of educational associations since World War II and their overlap. He opines we do not want an overall Federal control spokesman, but instead organizations like the American Council on Education should reshape themselves. The creation of new organizations should be investigated thoroughly as to need and duplication before they are started.

● U. S. Congress. House. Legislative Reference Service of the Library of Congress

The National Science Foundation, A General Review of Its First 15 Years

Report of the Science Policy Research Division, Legislative Reference Service of the Library of Congress, to the Committee on Science and Astronautics. U. S. Government Printing Office. Washington, D. C. 1965.

The report provides a background of purpose and concepts underlying establishment of the National Science Foundation, and considers its development over the first 15 years, its authority, and its evaluation reflected in budget and program elements. Established by enactment of Public Law 81-507 on May 10, 1950, the Foundation has undergone but few amendments; the most significant occurred in 1962 when certain elements of government-wide policy making and coordination were transferred to the new Presidential Office of Science and Technology. The organizational structure and functions of NSF are described in detail. Present legislation contains no limitations on the amount of funds which may be authorized; NSF has "no year" funds and its appropriations remain available for obligation and expenditure for such periods as specified in the appropriations acts. Under its broad charter, NSF initiates and supports basic research and education in the sciences and carries out these and related activities through its various divisions.

S T U D E N T S

ASSISTANTSHIPS AND AID, PREPARATION AND PROGRAMS FOR ASSISTANTS

● Dubin, Robert, and Frederic Beisse

The Assistant: Academic Subaltern

Administrative Science Quarterly, Volume XI, No. 4, 521-547, March, 1967.

The historical role and development of the teaching assistant in American higher education are described in detail pointing out the major problem of the discrepancy between legitimacy of task and the nonlegitimacy of status accorded the T.A. The slowness of college administrators and professors to analyze the nature of this problem and means for its solution, can lead to T.A. demands through collective action--such as the sort employed at Berkeley and elsewhere. Undergraduate dissatisfaction and active protest have positive outcomes in forcing correction of the conditions which produce it; evidence suggests that professors and administrators are initiating steps for significant changes because of their indefensible positions in the matter.

● Heim, Peggy, and Becky Bogard

Compensation of Graduate Assistants, 1968-69: A Preliminary Survey

AAUP Bulletin, Volume LV, No. 4, 483-488, December, 1969.

Some portion of teaching and related work is now done by graduate assistants. This arrangement has financial advantages for the institution and also the student. The questions are whether the workload becomes so substantial that it cuts deeply into the time available for the student's own studies, and/or if he is remunerated at rates substantially below those offered to others with similar preparation, ability and experience for comparable jobs.

● Heiss, Ann M.

The Preparation of College and University Teachers

Center for Research and Development in Higher Education, University of California, Berkeley. 1968. (Mimeographed.)

Heiss discusses the general environment usually experienced by a teaching oriented Ph.D. candidate, the arguments of teaching versus research, the characteristics of teaching assistant programs, the opinions of students, the unionization of T.A.'s, internships, and the doctorate in college teaching. Eight recommendations for reform in preparation of college teachers are given: responsibility for preparation for college teaching should not be transferred to the School of Education; active support should be sought for prepa-

ration for teaching; a new degree for college teaching should be seriously considered; universities should frankly admit that the T.A. serves an important institutional need; offer a well-planned and supervised orientation to it; improve the lot of the T.A.; offer an internship in college teaching as an alternative or option to the T.A. (an optimal model, patterned after the Michigan Center Plan, should be considered); and Berkeley Center research indicates students want alternatives to the narrow specialization of the Ph.D.

- Heyns, Roger W.

  The Graduate Student: Teacher, Research Assistant, or Scholar?

  The Graduate Journal, Volume VII, No. 2, 310-316, Spring, 1967.

  Evidence indicates that the graduate student's plight is not a happy one. Basic emphasis is on mastership of subject matter wherein the mechanics of the educational process are dominant. The graduate student is not a professional, but on his way to becoming one; he learns the values attached to scholarship but he is not accepted as a scholar until his thesis stage, if at all. Apprentice teachers must be a recognized part of the effort and the advantages can be justified economically and educationally. It is proposed that more of our educational opportunities should be organized around the concept of a "Learning Team" comprised of the undergraduate, the graduate and the professor, and with the subject matter, probably interdisciplinary, close to the frontier of subject exploration.

- Monson, Charles H., Jr.

  Teaching Assistants: The Forgotten Faculty

  The Educational Record, Volume L, No. 1, 60-65, Winter, 1969.

  This article discusses T.A.'s and how important they are to today's university. T.A.'s are involved in from 25-50% of all undergraduate credit hours produced; they also grade papers and tests. Every freshman at one time or another will have been taught by a T.A. and the average freshman by three; some will be taught only by teaching assistants, and they determine the impression of 30-40% of the freshman class, yet are given no voice in the running of the department. Recommended solutions suggested by Monson come from a study done at the University of Utah: the most important is a described ideal standard by which department chairmen might measure their own treatment of T.A.'s, that faculty and chairmen begin thinking of T.A.'s as part of their educational system and extend to them the courtesies of newly appointed young faculty.

- Nowlis, Vincent, et al.

  The Graduate Student as Teacher

  American Council on Education. Washington, D. C. 1968.

  This is a general review of teaching assistants. The authors contend what is wrong with T.A.'s revolves around little preparation, supervision, recognition or direction for teaching. The report gives opinions and suggestions from three viewpoints: the undergraduate, faculty, and the graduate T.A. The answer--the authors state--is training and back-up; and as an example of a model T.A. program, the University of Rochester plan is cited.

- U. S. Department of Health, Education, and Welfare. Office of Education. Bureau of Higher Education, by John L. Chase

  Graduate Teaching Assistants in American Universities: A Review of Recent Trends and Recommendations

  OE-58039. U. S. Government Printing Office. Washington, D. C. 1970.

  Chase traces the background and the historical milestones in the evolution and development of the teaching assistant in American higher education. He discusses, in four chapters and an appendix of statistical tables, the general characteristics and the statistical dimensions of the T.A. universe, the policy studies undertaken and their recommendations, and concludes with a final review of the major findings of the study and analyses. The major reference and data sources are identified. Among the major conclusions are: the T.A. holds a lowly status with little recognition or supervision at his institution, he receives little training for his role and often receives the lowest stipend paid graduate students, the requirements of the T.A. extend considerably the time to complete his doctorate, nonduty and T.A. stipends should be equalized, and more funds should be made available for T.A.'s. The author is pessimistic about future improvements unless the public demands quality teaching and is willing to pay for it with tangible financial support.

ATTITUDES AND CHARACTERISTICS, ATTRITION, PROBLEMS, UNREST

● Altbach, Philip G.

Commitment and Powerlessness on the American Campus: Notes on Graduate Students

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 123-130. July, 1969.

The author describes and analyzes the position and attitudes of graduate students today. Some of these have resulted in trade union demands and others have been the basis of discussions and proposals for reform. The young faculty have a close relationship to graduate students and share many of the same objectives; the young radical faculty member is often the only person who can communicate with the students--therefore, he becomes crucial in a crisis. The author concludes that there is a real need for research on the graduate students and academic reforms they espouse.

● Avorn, Jerry L., et al.

Up Against the Ivy Wall

Atheneum Publishers. New York. 1968.

This is an assessment, by the staff of the Columbia Daily Spectator, of the events and factors causing and contributing to the crisis at Columbia University (student involvement, the position of the SDS and the Students' Afro-American Society) and a general history of the disturbance. The basic cause is ascribed to the university's lagging behind and failing to respond to the realities of society and its problems; the archaic system of the university--existing within its own narrow problems and under the control of administrators and trustees "out of the mainstream" of things--complicated by faculty and student bodies that were discontented with many issues. The roles of the "Morningside Heights" issue, the "Institute for Defense Analyses" issue, and the discipline system at the university are reviewed in perspective to the ability the SDS had in mobilizing wide support and in causing sources of frustration and problems.

● Axelrod, Joseph, et al.

Search for Relevance: The Campus in Crisis

Jossey-Bass, Inc., Publishers. San Francisco. 1969.

This book, edited by Axelrod and Freedman, was jointly authored by five men. It addresses itself to the major current issues of higher education: colleges today are outdated and medieval in their teaching methods, their authoritarian approaches and educational practices show them to be unwilling

to adapt to the conditions and complexities of the modern world, student unrest is only a reflection of society's unrest--the "issues" of Viet Nam and the disadvantaged are only symptoms of broader problems. A theory of student development for the derivation of educational goals is offered and new programs, curricula and organization are proposed for their accomplishment. Throughout the recommendations, the importance of treating the student as an individual is stressed: institutions today must prepare him to play a variety of roles demanded by society; the student-faculty relationship should be changed to become more direct and intimate; the present structure of curriculum should be abolished; and the approach to learning must be based on joint faculty-student inquiry to permit individuality, creativity, and responsibility to thrive.

- Brown, E. Richard

  Rebellion in the Academy: Activism and Unionism among Berkeley Graduate Students

  Department of Education, University of California, Berkeley. April, 1970. (Mimeographed.)

  This study explores the significance of graduate students' activism on their present and future roles in the university and the role of unionism in the growing rejection of academic norms and values among Berkeley graduate students. Students classified themselves as student or scholar; nonunion scholars are most committed to the norms and values of professionalism, nonunion students are passively alienated from the system. Union scholars are committed to professionalism but dissatisfied with the lack of relevance of their fields, and politically radical compared to the nonunion scholars. Activism is not caused by union membership but more by students' perceptions of the irrelevance of their academic endeavors to societal problems and issues, and it conflicts with the values and structure of traditional graduate education. Graduate students committed to change will have a problem succeeding as faculty in the academic establishment and as they grow in numbers, but not power; defensive organizations oriented to the disciplines and professions will arise to give them the security to withstand the pressures of institutionally valued orthodoxy.

- Committee on The Student in Higher Education

  The Student in Higher Education

  The Hazen Foundation. New Haven. January, 1968.

  This report criticizes the present day American system of education for not being more concerned about the total personality development of its students. The treatment of freshmen in particular is discussed both as to their education and as to their living conditions and orientation. The author envisions an experimental college with a whole new concept of learning and living. First-year students would have direct relationships with good faculty members and

most courses would be in seminar form. Students would be encouraged to take time off for education in the world outside and would also be given more say in educational planning and rule making.

● Elberg, Sanford S.

Causes and Effects of Student Unrest

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 25-37. December, 1967.

Of the four subcultures on campuses identified by Clark and Trow--collegiate, vocational, academic, and nonconformist--Elberg believes that the latter is where the activists are bred. He proposes that today's activists (and yesterday's quiet students) are a reflection of the major trends in society, and not a development of the campus. The Civil Rights movement had a great influence, but the Viet Nam War is the overriding issue, abetted by secondary complaints such as the lack of participation in governance, lack of privacy and lack of time for individual thought. The beginning of unrest at Berkeley, the problems involved, and a case history of events are traced and elucidated.

● Enarson, Harold L.

Campus Unrest and Campus Reform

Report of a Legislative Work Conference on Higher Education. Robert H. Kroepsch and Dorothy P. Buck, editors. Western Interstate Commission for Higher Education. Boulder, Colorado. 3-8. February, 1970.

The reasons for the calm existing on campus during the fall of 1969 through February of 1970 are discussed; the attitudes of students are analyzed, and the need for university reform--with guidelines for reform--are presented. These involve a need for a shared purpose, a restructuring and a reinvigoration of university governance with clear purposes and priorities focused on a learning society related to life's purposes, and modernizing the curriculum to become more relevant to reality.

● Fact-Finding Commission on Columbia Disturbances. Archibald Cox, chairman

Crisis at Columbia

Vintage Books, Random House, Inc. New York. 1968.

Shortly after the disturbances at Columbia University in April and May of 1968 the Executive Committee of the Faculties appointed a fact-finding committee, headed by A. Cox, to investigate and report on the disturbances. For 21 days the Commission held formal and informal hearings and interviewed all involved; it studied the underlying reasons of the crisis and the actual

physical events, and then gave its conclusions. The report is presented in three parts: "Conditions Giving Rise to the Disturbances," "History of the Disturbances," and "General Observations." The commission concluded that the university became the surrogate for the frustrations of the students for United States policy in Viet Nam; the revolt was led by the revolutionaries but supported by students and the junior faculty. Three internal causes of unrest are cited as important: authoritarianism of administration, inferior quality of student life, and failure to face the difficulties that black students encountered. Recommendations are made for needed reforms and solutions to problems.

- Glass, John F., and Judith Glass

Improving Graduate Education

The Educational Forum, Volume XXXII, No. 4, 439-446, May, 1968.

The original article, written by two graduate students in 1965, criticizes the traditional atmosphere of graduate education. The authors recommend student-centered education; advocate dispensing with independent research for those who desire to teach; recommend apprentice teaching to an experienced, accomplished teacher; and recommend greater participation by graduate students in all departmental affairs. In an addendum written later in 1968, the authors feel that innovative changes, although not widespread, have occurred, and predict a continuing shortage of teachers.

- Gordon, David M.

'Rebellion' in Context: A Student's View of Students

The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 292-314. 1966.

The author, a graduate research assistant at Harvard, presents his views, mostly critical, of the graduate school as indicative of the student response to the existing system.

- Heiss, Ann M.

Berkeley Doctoral Students Appraise Their Academic Programs

The Educational Record, 30-44, Winter, 1967.

Heiss mailed out 3,165 questionnaires to doctoral students in 56 departments; 71% were returned completed. The responses served as a basis for interviewing 100 students at the dissertation stage, representing the broad academic divisions at Berkeley. Eighty-three percent said that they were more satisfied than dissatisfied with their overall doctoral experiences; greatest dissatisfaction was found in the social sciences and the least in the physical sciences and the professional schools. The students expressed a greater need for a more personalized experience and a closer involvement with their professors. Fourteen recommendations were made to improve the graduate experience and programs at Berkeley.

- Heist, Paul, editor

  The Creative College Student: An Unmet Challenge

  Jossey-Bass, Inc., Publishers. San Francisco. 1968.

  This report summarizes and discusses the conference on creativity with respect to society's role in handling, encouraging and funding creativity. It was debated whether special programs should be established or if society should let the creative person develop on his own--perhaps dropouts from education are the only answer. Concluded that: we have no good ways to test for creativity and that creative students are misfits in a normal program--results show that dropouts from prestigious schools are highest for those students deemed creative and high achieving, and that many often become activists; usually, greater numbers of noncreative students finish the college of their original choice than do creative students; grades are no predictor of creativity nor are standard tests; we should nurture creativity by honors programs, seminars, automated teaching devices and self-progress programs; however, teachers are not prepared to teach the creative.

- House, J. Robert

  Graduate Withdrawals: Another Approach

  College and University, Volume XLI, No. 3, 314-319, Spring, 1966.

  This report is an investigation at San Francisco State College of those students successfully completing the master's degree in education and of those withdrawing from the program. No single pattern could be determined. As the study was exploratory, sufficient data were not collected to give definitive answers to the questions raised about student separation. Author believes further research would be beneficial.

- Kagan, David

  Role Expectations of Doctoral Candidates and Their Faculty Sponsors

  Doctor of Education Dissertation. University Microfilms, Inc. Ann Arbor, Michigan. 1966.

  This study was undertaken in the UCLA School of Education for the doctoral dissertation (D.Ed.) with the subjects consisting of 32 faculty members and 68 doctoral students of this school. The author's findings and conclusions were: there is an increasing attrition rate of apparently qualified graduate students as measured by past academic performance and aptitude scores, a study of the relationship between the doctoral student and his faculty sponsor is long overdue, and the Doctoral Sponsor and Candidate Role Questionnaire was formulated because of this rationale. Data from this study show three salient features: certain personality variables are very important in determining which doctoral candidates will complete all requirements, professors communicate

divergent expectations of sponsor and candidate roles to their students, and an inconsistency exists in the real beliefs held by both professors and students as opposed to those actually espoused. Author concludes that a system of selection and guidance is needed which takes into account the abilities, personality traits and expectations of both faculty members and students, and the matching of each student to a sponsor with whom he will be compatible.

- Katope, Christopher, and Paul G. Zolbrod

Beyond Berkeley: A Sourcebook in Student Values

Harper & Row, Publishers. New York. 1966.

This is a series of articles, commenting in detail on the student revolt at Berkeley in 1964, giving a chronological account of events and developments from September 14 to January 2. Diverse authors, including faculty, students and outside observers, express their views and opinions of the situation. The remaining articles in the book are historical papers on social unrest by well-known leaders and authors from the time of Plato and Aristotle to modern times.

- Keniston, Kenneth

The Faces in the Lecture Room

The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 315-349. 1966.

This is a description of characteristics of students and the rapid changes as admission standards become increasingly selective; the aims of education are to induce change. The match between student needs and capacities and the institutions is far from perfect, nor should it be viewed as ideal. Three types of students are described: the activist-personal demonstration, the disaffiliate-personal withdrawal; and the underachiever-personal blame. Contemporary heroes of students are men of intense technical competence, high professional expertise and careful specialization.

- Lowry, Howard F.

The College Product for the Graduate School

Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 18-22. December, 1963.

Lowry discusses the type of person the liberal arts college would like to send the graduate school. College should give the broadness, provide the languages, and still give a respectable measure of depth in a major field--with independent work culminating in a senior thesis. "We would like to send to graduate schools persons, not artisans. They can do all you want them to do and more. They might even become teachers."

- National Commission on the Causes and Prevention of Violence. Task Force on Demonstrations, Protests, and Group Violence, by Jerome Skolnick

  The Politics of Protest

  A Staff Report to the Commission. U. S. Government Printing Office. Washington, D. C. 1969.

  The history of student protest, starting in the late 1950's with non-violent protests for Civil Rights and including the inception of SDS in the early 1960's, is traced. Skolnick considers the 1964 Free Speech Movement at Berkeley to be the turning point. The confrontation principle, started in 1965 against the war in Viet Nam, is the principle also used at San Francisco State by Third World militants. Skolnick feels answer is not in more force, but in faculty-student discussion of grievances and solutions through a due process system of settlement.

- Panel Discussion: Richard, Ronald P., moderator; Homer D. Babbidge, Jr., John R. Christiansen, Jack Daniels, and Walter Marcus, panel members

  Comments on the Film, The Diary of a Campus Revolt

  Report of a Legislative Work Conference on Higher Education. Robert H. Kroepsch and Dorothy P. Buck, editors. Western Interstate Commission for Higher Education. Boulder, Colorado. 9-14. February, 1970.

  This is a report of a Legislative Work Conference on Higher Education, sponsored by WICHE, in which several participants comment on a documentary film made at the University of Connecticut by NET and presented to the Conference. Main conclusions reached were: every university is susceptible to violence, all sectors should be mobilized to combat it, and universities must be responsive to needed changes and reforms. Suggested solutions are presented and discussed.

- Renetzky, Alvin

  All but the Dissertation: A Study of the Factors of Attrition in Graduate Education

  University Microfilms, Inc. Ann Arbor, Michigan. 1966.

  This Ph.D. dissertation in education at the University of Southern California compared a sample of 100 active, successful doctoral candidates to 100 inactive, unsuccessful candidates, all in the School of Education. Eighty from each group answered a questionnaire survey by mail; twenty from each group were personally interviewed. From the study, 34 conclusions were made as to the factors contributing to failure or success in completing the Ph.D. The more pertinent conclusions were: attrition cannot be predicted from GRE scores or scores on the Comprehensive Examination in Education;

motivation, attitudinal change and orientation, the ability to crystallize and start a dissertation topic relatively early in graduate work, and the degree of satisfaction with graduate work were associated with success; full-time work, reading habits and many other factors were not significantly associated with attrition, while the degree, nature, and extent of student-faculty interaction--including the degree of dissertation committee interaction--were significantly related to attrition.

● Sanchez, David J., Jr.

The Position of the Contemporary Graduate Student within the University

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 131-134. July, 1969.

The author, a recent Ph.D. recipient, presents the problems and frustrations encountered in graduate school from the perspective of the student's experience. His critical indictment can be summarized as follows: the graduate student is neither fish nor fowl--he is not accepted by the outside world as a responsible adult, by the faculty as a relevant person, nor is he close to most other graduate students because of his wide specialization.

● Sanford, Nevitt

Where Colleges Fail: A Study of the Student as a Person

Jossey-Bass, Inc., Publishers. San Francisco. 1967.

This book is based mainly on lectures and addresses given since the publication of The American College (1962), but also addresses itself to aspects of student development and features of the college environment, topics mostly not covered in The American College. The major aim is to help restore the student to his rightful place at the center of the college's activities. The subject is treated in five major parts: Part I states the case for individual development as the primary aim of education, Part II presents a theory of how students actually develop, Parts III and IV then apply the theory to various aspects of the student's development and the college educational procedure, and finally, in Part V ways are suggested in which colleges might take advantage of outside pressures instead of merely submitting to or ignoring them.

- Semas, Philip W.

  Students 'Satisfied' with Education, Most of Them and Teachers Agree

  The Chronicle of Higher Education, Volume V, No. 15, 1-2, January 18, 1971.

  This article summarizes the surveys, sponsored by the Carnegie Commission on Higher Education, and includes responses from more than 60,000 faculty members, more than 30,000 graduate students, and more than 70,000 undergraduates at 300 institutions. The data collected in 1969 show that 70% agreed that they are satisfied with their education; only 13% of the undergraduate and 6% of the graduate students said that they were dissatisfied. Sixty-two percent of the graduate students felt that undergraduate education had suffered from specialization of faculty members but only 38% of the faculty agreed. Faculty members were amenable to giving graduate students a voice in the content of graduate courses and degree requirements, but generally preferred not to give graduate students a vote in these matters.

- Taylor, Harold

  Students without Teachers: The Crisis in the University

  McGraw-Hill Book Company. New York. 1969.

  The universities have failed the students by not providing for them faculty to whom the students can give their loyalty, respect and trust. Taylor suggests reform in mass education and urges the return to progressiveness in educational thought and action to restore a sense of purpose and relevance. He proposes that students must be given an active role and entrusted with responsibility for shared planning in educational and political policy decision. The author stresses reorganizing the university so that the experience of its students in thinking and action can teach them, the students, what it means to serve mankind and to honor the intellect.

- Tippo, Oswald

  The Changing Role of University Students

  Washington State Review, Volume XI, No. 4, 10-13, Summer, 1968.

  Tippo states that the causes for student unrest stem from both the students (present youth is more politically motivated, bored with present life, impatient, frustrated, and fascinated by four letter words--the real obscenities being Viet Nam and pollution), and the university (lack of effective mechanisms to replace outdated social and class systems and traditions, and lack of involvement of students in governance). The solution is complex, but involves reforms of the system: need to devote more time to students, need to assist them in becoming adults, and need to encourage parents to give more attention to their children in the formative years.

- Trow, Martin, and Travis Hirschi

  Age, Status, and Academic Values: A Comparison of Graduate Students and Faculty

  Changing Patterns in Graduate Education. Highlights from papers presented at CRDHE's Conference on Higher Education, St. Louis, October, 1970. The Center for Research and Development in Higher Education. Berkeley. 14-17. 1970.

  This paper is based on the Carnegie Commission's National Survey of Higher Education, 1969, involving 303 institutions, 61,000 faculty, 158 institutions and 33,000 graduate students. Due to the lack of real alternatives, rather than a total commitment to scholarship, "the student activist of today is apt to be the college professor of tomorrow." The younger faculty differ markedly from the older faculty and the leftward drift in thought between current faculty and graduate students remains large and increasing. The overall conclusion is that the differences found are not going to disappear but rather are likely to persist and become sharper. Large numbers of academic personnel in positions of power will accentuate and contribute to the trend which widens the gulf between the institutions and the environing society.

- Tucker, Allan

  Some Questions about the Critics of Graduate Education--and Their Criticisms

  Proceedings of the Twentieth Annual Meeting of the Midwest Conference on Graduate Study and Research. D. R. Clippinger, editor. The Midwest Graduate Study and Research Foundation Incorporated. Chicago. 18-35. April, 1965.

  This paper reported results and opinions obtained in two studies conducted at Michigan State University in 1960 and 1962 on the validity of the ten most common criticisms made of graduate education. Both studies, although not consistent in the type of respondents (one group was composed of doctoral recipients and the other was composed of beginning graduate students), had some common questions; therefore, comparisons were possible. The majority considered most of the criticisms as invalid; they cited the following as valid criticisms: too many formal hurdles and initiation rites, and faculty members who were more interested in research than in their students. The report concluded that only a minority of the respondents were critical of graduate education and that most criticisms were leveled at the behavior of graduate faculty toward their students--not at the system of graduate administration or at the requirements. Three differences between what students expected and what they actually experienced stood out: faculty was more interested in research than in their students, faculty was insensitive to student needs, and faculty's teaching ability fell short of expectations. It was recommended that departments hold meetings to decrease the misunderstandings, frustrations, and tensions from which most unhappiness and criticism too often spring. Tucker noted that the history of graduate education reveals the same criticisms being expressed for over 60 years; yet, there have been few changes or revisions in the general requirement for the doctoral degree.

● Tucker, Allan, et al.

Attrition of Graduate Students at the Ph.D. Level in the Traditional Arts and Sciences

Office of Research Development and the Graduate School, Michigan State University. Publication No. 8. East Lansing, Michigan. 1964.

This detailed, comprehensive, national survey of students enrolled as Ph.D. candidates from September 1950-1953 (those not completing the doctorate by 1962 were considered dropouts) in the traditional arts and sciences fields of 24 selected universities, reports the experiences and attrition of the graduate students studied. The introductory chapter discusses the problem and is followed by a description of the sample, attrition statistics, conduct of the survey, problems and factors attending and influencing graduate study and the reasons for attrition. The final chapter summarizes the conclusions, opinions and recommendations: attrition rate was about 31%; personality, motivation and doing research for the Ph.D. are major causes of dropout; graduate schools should recruit earlier and be more selective in admissions; once admitted, the student should be assigned to a compatible professor; and better communication between faculty and students is needed.

RESEARCH ON STUDENTS, EVALUATION, PERFORMANCE

● Alciatore, Robert T., and Ruth E. Eckert

Minnesota Ph.D.s Evaluate Their Training

University of Minnesota. Minneapolis. October, 1968.

Two groups of Minnesota Ph.D.'s--those granted degrees in 1954-56 and studied ten years later, and the 1935-48 recipients studied in 1950--were surveyed with about an 86% response rate. Major conclusions were: graduate school had prepared students well as research scholars; less attention was given to develop skills and abilities needed for teaching and administrative roles, or to promote general liberal education; 67% were employed on academic staffs and wished they had received more explicit preparation for this role; internships in higher education were successful in preparing students for later faculty service and this program was recommended for the preparation of future students. Recommendations made for further studies were: continue evaluation studies and later career needs, encourage interdisciplinary programs and training, increase alternatives for language requirements, and provide follow-up studies every ten years for critical appraisal of programs.

● Astin, Alexander W.

The College Environment

American Council on Education. Washington, D. C. 1968.

The purpose of the study was to identify and measure some of the important differences among college environments. Four main areas were covered: the peer environment, the classroom environment, the administrative environment, and the physical environment. Types of institutions, types of control, geographic differences, and the role of sex and other factors were discussed. The study concluded that the changes that take place in the student during his undergraduate years might be highly dependent on the type of institution he attends and its influences.

● Cieboter, Frank J.

Factors Related to the Performance of Foreign Graduate Students

The Journal of Educational Research, Volume LXII, No. 8, 360-365, April, 1969.

The purpose of the study was to examine the interrelationships between the GRE, GPA, geographic area of origin, and college major field for 218 foreign students enrolled in United States graduate schools in 1969. It concluded that foreign graduate students differ greatly and should not be categorically grouped under one heading for either testing or grading purposes, performance appears to be directly related to proximity of his geographic area of origin to an English speaking area or to a center of Western culture, and British Commonwealth students did best on GRE Verbal Test and Far East students the worst.

● Connor, James R.

A Study of University of Virginia Doctor of Philosophy Degree Recipients 1957-1963

Office of Institutional Analysis. University of Virginia. Charlottesville, Virginia. November, 1963.

This is a report on Ph.D. recipients from 1957-63, noting a small increase in the number of degrees awarded in the seven-year period of 278 which does not include 75 professional doctorates awarded from the schools of law, science-engineering, and education. Report's statistics showed that 90% of the recipients were males, 76% were married with a median of one child per graduate family, over half were from southern states (40% from Virginia) and their baccalaureates and/or master's degrees had been earned from southern institutions. Completion of the doctoral work at U. Va. coincided with the national median for time. When choosing their initial employment, 2/3's took employment in 112 academic institutions throughout the United States--majority were large, publicly-controlled universities. At the time the Ph.D. degrees were awarded, 1/3 of these graduates were in business, industry, professional organizations, government, hospitals, the military, or postdoctoral study.

- Elder, J. P.

  A Criticism of the Graduate School of Arts and Sciences in Harvard University and Radcliffe College from Those Who Took the Ph.D. at These Institutions between 1950 and 1954

  Harvard University Press. Cambridge, Massachusetts. 1958.

  Under a grant in 1955, Elder made a study of graduate education at Harvard and Radcliffe to ascertain the good and bad features of the system. Responses were received from 88.6% of the men and 91% of the women granted doctorates from 1950-54. As a result of the study, 12 recommendations were made involving the language requirements and foreign language instruction, courses outside the major field, smaller seminars graded as "pass or fail," guidance and workload of the teaching fellows, requirements for the preliminary examinations, choice of thesis topic and nature of the dissertation, periodical review of students' progress, and strengthening of faculty-student contact.

- Lannholm, Gerald V., et al.

  Cooperative Studies of Predicting Graduate School Success

  Graduate Record Examinations Special Report Number 68-3. Educational Testing Service. Princeton, New Jersey. 1968.

  Results of studies involving ten graduate schools and one or more departments of chemistry, English, history, philosophy, physics, and psychology are reported for students enrolled in these departments during the period 1957-1960. Predictor data for the students included GRE scores and undergraduate GPA's; assessment of performance in graduate study consisted of departmental ratings of the quality of graduate work and the student's academic status (e.g., "earned Ph.D.," etc.) as of October 1963. The results vary widely from group to group and, on the whole, indicate that predicting success in graduate school is exceedingly difficult. Ways to improve prediction are needed and several suggestions clarifying what is meant by "success," identifying additional predictors, and longitudinal studies, are offered.

- Manning, Winton H.

  The Research Program of the Graduate Record Examinations Board: A Framework for Planning for the 1970's

  A working paper for a meeting of the Graduate Record Examinations Board, Educational Testing Service, Princeton, New Jersey, September 19-20, 1969.

  This is a description of the current research effort, and future mapping and planning for research, of the Graduate Record Examinations Board during the 1970's. Ten broad areas for future research--patterns of entry into graduate study, undergraduate counseling and talent recruitment, student costs and financial aid, application and admission procedures, admission standards, student mobility, academic placement and curriculum articulation, learning environments,

academic and career achievement criteria, and evaluations of the GRE Program--are described. These descriptions are presented in terms of four transition stages (input energy, distribution, modifying functions, and output measures) for the process of movement into, and progression through, graduate education of the general category and the special groups of students who constitute the graduate student population.

- Mehrabian, Albert

Undergraduate Ability Factors in Relationship to Graduate Performance

Educational and Psychological Measurement, Volume XXIX, No. 2, 409-419, Summer, 1969.

The purpose of the study was to examine the relationships among criteria which can be utilized in making admissions decisions concerning graduate psychology programs, and to assess the validity of these admission criteria. Candidates (266) for admission to the graduate psychology program at UCLA were selected for the study on the basis of availability of information on 13 criteria which included: scores on GRE Aptitude Tests, scores on GRE Advanced Test in Psychology, scores on the Miller Analogies Test, overall undergraduate GPA, junior and senior GPA only, the number of mathematics and logic courses, the Cartter rating of the psychology faculty where the applicant attended, research experience, research versus service orientation as assessed by biographical statement and recommendation letters, and the acceptability of the candidate as rated by a committee. Data were interpreted by factor analysis which yielded factor groupings, correlation and intercorrelation routines, and stepwise regression analysis. It concluded that the strongest predictor of graduate performance was the GRE-MAT index, next was the letter of recommendation rating, and third was the last two years' GPA.

- Nash, George

Review of Financial Aid Research

Journal of National Association of College Admissions Council, Volume XIV, 20-28, June, 1969.

Based on a review of 96 references on financial aid, the more important findings and conclusions were: many high ability students who do not go to college often fail to do so because of reasons (home factors, family attitudes, marriage, maternity, etc.) other than lack of financial aid; economic and social barriers do prevent many students from entering college but financial grant-in-aids do not have the great effect in increasing the numbers enrolling as commonly supposed; a scholarship program without a need factor will have little impact on college-going plans of talented students; motivation is one of the most important factors in going to college; colleges must recruit more from minority groups and once enrolled these students must be provided remedial courses, special counseling, and reduced course loads. Precedents have been established in helping the bright students, the athlete, and the foreign student

but much remains to be done for the "high risk" student; we need a better system to collect data regularly and systematically on a national basis and in determining the effectiveness of Federal aid programs.

- Reilly, Richard R.

Critical Incidents of Graduate Student Performance

Graduate Record Examinations Board Technical Memorandum No. 1. Educational Testing Service. Princeton, New Jersey. April, 1971.

This is a report of the first phase of a study aimed at better defining the criteria of graduate student performance by collecting descriptions of specific observable events which caused 150 graduate professors--50 from each of the fields of English, pscyhology and chemistry--to raise or lower their estimate of the competence of graduate students. Almost 2/3's of the faculty members sampled responded to the survey, but only 75 of the responses were judged usable. Results were examined and tabulated and a final list of 52 incidents, out of a total of 336 separate incidents provided, were retained, based on three criteria used to determine representativeness, applicability and to eliminate duplication of response. It was concluded that the results of Phase I can be reviewed as a successful initial step toward empirical definition of several criteria of graduate student performance for use in further studies, particularly to explore further the critical incidents of student performance, by empirically deriving a number of factors through factor analysis of ratings of students made with the list of incidents collected in Phase I.

- Schatte, Curtis Eric

Doctoral Degree Programs at Texas A&M University: An Appraisal of the Programs by Recipients of Doctoral Degrees

The Graduate College, Texas A&M University. College Station, Texas. July, 1970.

Conducted as a Ph.D. dissertation, this study reports results of a questionnaire and graduate college file survey designed to provide the pre- and postdoctoral profiles of selected doctoral recipients from Texas A&M University from 1940-1968. The 562 respondents majored in 52 academic or professional disciplines representing seven colleges. In general, the respondents approved of their doctoral experiences and commended both their programs and professors. Over 90% indicated they would undertake the Ph.D. again if given the choice and over half said they would seek the doctorate at Texas A&M again; 70% said they would earn the degree in the same or closely related field. Over 40%, mostly recent graduates, indicated they would prefer to work under less anxiety.

- University of Virginia. Office of Institutional Analysis

  Follow-up of 1967-1968 Degree Recipients of the Graduate School of Arts and Sciences

  University of Virginia. Charlottesville, Virginia. April, 1969. (Mimeographed.)

  This is a profile comparison of the 1967 and 1968 graduates at the University of Virginia responding to a detailed questionnaire in regard to age, marital status, state of residence at time of admission and at time of response, employment status, time to complete degrees and other questions.

TYPES OF STUDENTS AND PROBLEMS

(Foreign, Disadvantaged, Minority, Women)

- Bayer, Alan E., and Robert F. Boruch

  The Black Student in American Colleges

  American Council on Education Research Reports, Volume IV, No. 2. Washington, D. C. 1969.

  The results of a 1968 survey of 243,000 freshmen at 358 institutions, conducted with the purpose of finding out the backgrounds, interests, and opinions of black students as compared to nonblack students, are given. Major differences in educational backgrounds and preparation are found to exist. More white students choose the professions, the physical sciences and engineering, whereas blacks choose social science, business or education. Educational activities and objectives in the first year after enrollment are similar for the two groups.

- Carlisle, Donald

  The Disadvantaged Graduate Student in Predominantly Non-Negro Institutions

  Proceedings of the Eighth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. San Francisco. 75-94. December, 1968.

  Carlisle reviews recent efforts in predominantly non-Negro institutions to increase the number of graduate students from disadvantaged backgrounds and from ethnic minority groups in graduate schools. He characterizes and inventories the type of support and programs in both graduate and professional schools, including business administration, law, medicine, and social welfare, multidisciplinary programs on a broad base, and special student programs for minority groups.

● Cass, James

Can the University Survive the Black Challenge?

Saturday Review, 68-71, 83-84, June 21, 1969.

Most of the issues and problems discussed and reviewed are mainly directed to undergraduate education, but many are equally applicable to graduate education. The main thesis of the essay is that as more blacks demand and are granted admission to predominantly white institutions they create critical problems to the survival of the institutions. Most blacks want to make it within the white society, but no longer solely on white terms. Like students in general, they reject the archaic features of higher education and are demanding reforms of the entire system. The university's options are still open--it can renew itself through reforms demanded and accommodate the aspirations of the minority groups; but, in so doing, it must learn to distinguish between the demands of the campus revolutionaries and those of the militant reformers.

● College Entrance Examination Board

The Foreign Graduate Student: Priorities for Research and Action

College Entrance Examination Board. New York. 1971.

Highlights of the Colloquium sponsored by the National Liaison Committee on Foreign Student Admissions are reported. A reassessment is needed in regard to foreign graduate students. The number has been reduced because of the high cost of graduate education and the demands of United States militant minorities. Many countries are suffering from an oversupply of Ph.D.'s with no pyramidal structure of trained assistants. There must be a review in terms of national and transnational needs with emphasis on the "relevant" needs and the financial aid the students receive. The members of the conference urged that existing fellowship support programs be maintained.

● Egerton, John

High Risk

Southern Education Report, Volume III, No. 7, 3-14, March 1968.

This review discussed the SREB Commission's report on high risk admissions. Egerton found that the majority of the 215 schools he questioned showed no interest in accepting disadvantaged youths, who will need remedial help. The schools are courting the bright disadvantaged student, but without major financial help from either the Federal government or foundations, the universities are not actively seeking out the "High Risk" students. Among all the programs for the disadvantaged surveyed, only 15-20 merit in-depth consideration and further study; a few outstanding programs are reviewed.

- Hartshorn, H. Hadley

  The Relevancy of Graduate Education

  Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 22-25. December, 1969.

  The author indicates that the proper role for the education of the disadvantaged post-baccalaureate student and the solution of domestic problems reside in the graduate schools. He alleges that graduate schools neither provide avenues for the education of academically disenfranchised students nor apply a meaningful part of their resources toward solution of the problems of poverty, race, urban decay and ghetto schools; they have the expertise, freedom, resources and organization necessary for solving these problems. Graduate education should be relevant in order to be meaningful; therefore, it should give these matters the highest priority when planning future graduate programs.

- Lavergne, Daly C.

  University and Government: Two Views of the Foreign Graduate Student

  University, Government, and the Foreign Graduate Student. College Entrance Examination Board. New York. 28-48. 1969.

  This is one essay from a colloquium that discussed the foreign graduate student and the involvement of the Federal government in foreign graduate student programs, particularly AID. The author feels that the main interest of the Federal government in the foreign student is for reasons of international foreign policy development. In order to fulfill this policy, government relies heavily on the educational community.

- Nichols, David C., and Olive Mills, editors

  The Campus and the Racial Crisis

  American Council on Education. Washington, D. C. 1970.

  This book consists of papers given at the annual meeting of the American Council on Education and discusses the problems as seen by the 44 authors. In their overlook, the editors discuss the past decade with regard to the Negro and society when the demands of the blacks on the campuses gave focus to widespread frustrations and served as one of the principal thrusts against established order. The racial crisis is part of a greater and more basic crisis of values and idealogies gathering momentum in American society and bringing turbulence to the college campuses. The authors see changes in the future: some type of "bridging" education, more power for students in university decisions, Black Studies as a part of the curriculum, more importance for teaching,

and the university's becoming more community minded and more discreet about defense-related research activities. The editors conclude that, eventually, students will find it better to reform the system, particularly through education, than to destroy it.

- Panel Discussion: Beach, Leonard, chairman; Charles D. Hounshell, H. W. Magoun, Samuel Nabrit, panel members

The Negro in the Graduate School

Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 90-104. December, 1963.

Leonard Beach, chairman of the panel discussion, offered the following points relative to the status of Negro graduate education in 1963: total of 1,200 Ph.D.'s and 600 Ed.D.'s were produced as of 1963, of the 500 Ph.D. candidates enrolled in 1963 the majority were in education, backgrounds were from "professional" homes and black schools, 85% of present Ph.D.'s were teaching in black institutions, 10% in white, and the balance in government, and he predicted a shortage in staffing Negro schools as a result of more of the current students entering government. H. W. Magoun of UCLA presented a historical sketch of Negro American education and statistical data concerning income, population, family size and the strata of Negro society; he felt that the ideas of DuBois were still being pursued and that inferior education was still being provided. Charles D. Hounshell of Emory University presented information about a new Woodrow Wilson program for teaching interns. Samuel Nabrit, President of Texas Southern University, gave an explanation for why there were so few Negro students in science and a scarcity of Ph.D.'s; he stressed the need for strong interim programs at the master's level in black institutions prior to the student's entering a Ph.D. program.

- Panel Discussion: Saiki, Patricia, moderator; Doug Davidson, Peggy Dycus, and Juan Ramos, panel members

Problems of Minority Students

Report of a Legislative Work Conference on Higher Education. Western Interstate Commission for Higher Education. Boulder, Colorado. 39-46. February, 1970.

This is a Work Conference Report, sponsored by the Western Interstate Commission for Higher Education, expressing the views of minority representatives regarding campus governance. Ramos discusses the problems of Mexican-American students: university life--educationally, socially, and organizationally--is foreign to them since it was designed for others; their needs and status must be considered. Dycus presents the views of the American Indian and the misconceptions concerning them. He states that they must be brought into contemporary society as real human beings and be given leadership roles achieved through an education that considers their individualism. Davidson reflects the problems of blacks, reviews the sources of black studies demands,

tells why most efforts are disappointing, and stresses that education should be designed to give blacks a role of self-determination.

- Rose, Arnold M.

  Graduate Training for the 'Culturally Deprived'

  Sociology of Education, Volume XXXIX, 201-208, Spring, 1966.

  Rose discusses the problems of the "Culturally Deprived" in graduate school and stresses the sociological and psychological factors as related to academic achievement and performance. Usually the economic limitation is not the serious problem because of the relative availability of financial assistance. There is a problem of lack of information in the ethnic minorities as to educational possibilities. Occupational achievement by the minorities has been less than their educational achievement and fewer occupational rewards obtained as a result of their education. Psychological and sociological barriers must be overcome; there is a special problem to decide if a minority student wants to be a scholar or a "race man" dedicated to his own ethnic group and problems, and the minority group problems are often completely lost in the established graduate school system with its own problems.

- Simpson, Renate

  Part-time Study at Postgraduate Level

  University Quarterly, Volume XXIV, No. 2, 201-211, Spring, 1970.

  In this survey of 292 British part-time postgraduate students at six universities, the data show little difference between their situations and the situations of part-time postgraduate students in the United States.

- Sims, Albert G.

  Summary of the Colloquium Discussion: Major Observations and Recommendations

  University, Government, and the Foreign Graduate Student. College Entrance Examination Board. New York. 3-7. 1969.

  This summary of the colloquium discussion concludes that the foreign graduate student should be more appropriately matched to the United States institution, probably by an institution-to-institution arrangement. Once here, he should be given some special help to overcome the loss of prestige he suffers. Close communication with the home country should be maintained both by the student and by the university to keep track of employment chances there. Recommendations for improvement suggest inclusion of representative 5-10% of foreign graduate students, provided with fellowships, but not financed

chiefly by the institutions. Students should be chosen for their ability, and an appropriate program provided for them to eliminate the double standard or special treatment system now prevelant on many campuses.

- Springer, George P.

  The Foreign Graduate Student: Old Assumptions, New Questions

  University, Government, and the Foreign Graduate Student. College Entrance Examination Board. New York. 8-27. 1969.

  Foreign students, according to Springer, represent 7.2% of all graduate students in the United States; therefore, it is best to accommodate foreign student procedures to those used for domestic students because both face the same transition problem from undergraduate to graduate school and many domestic students are from disadvantaged backgrounds. International relations are likely to be enhanced through student exchanges only if the focus remains on educational objectives. The brain drain, in its international aspects, is unlikely to be solved by unilateral actions--a study of its causes, extent, and effects is overdue.

- U. S. Department of Health, Education, and Welfare. National Institutes of Health. Office of Program Planning and Evaluation. Resources Analysis Branch

  Special Report on Women and Graduate Study

  Resources for Medical Research Report No. 13. U. S. Government Printing Office. Washington, D. C. 1968.

  This statistical report on women graduate students points out the many barriers faced by them in achieving their educational goals. Only 2/5's of the women enrolled in graduate school in 1964 were full-time students. Full-time enrollments ranged from a high, approximately 92 to 95%, in medicine and the physical sciences (which are usually heavily supported), downward to only 34% for those in sociology and anthropology. The chief obstacles to graduate study are: financial barriers, family responsibilities, no graduate school available and disapproval of husband. Provisions for child care centers, the availability of more part-time study opportunities and strong approval of husband are deemed essential to successful graduate study. In the health and science fields the greatest net losses in planned career fields in the three-year period following college graduation were in the areas of prime importance to medical research and education. Only 1/4 of the women enrolling in graduate school received a stipend compared to almost 1/2 of the men, and continuous graduate enrollment was twice as likely to occur for the woman who received a stipend as for those who did not.

- University of California, Los Angeles

  Enrollment and Support of Minority Graduate Students

  University of California, Los Angeles. Fall, 1968. (Mimeographed.)

  This study reports the enrollment, distribution by field, and financial support of four minority groups (black, Oriental, Mexican, and American Indian) at UCLA in 1968. Most were enrolled in the social sciences and about 1/2 were in the professional fields, mostly education; more than half received some type of financial support administered by the university. General conclusion was made that most Orientals and about 1/2 of Mexican Americans entered under existing programs, while most blacks and half of the Mexican Americans came in under special programs, and American Indians represented a very small part of the minority groups.

- Valien, Preston

  The Disadvantaged Student in Graduate School

  Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 51-56. July, 1969.

  The article discusses the history and the problems of the disadvantaged student in preparing for, applying to, and attending graduate school; and what help is being offered to remedy these problems. Valien stresses the need of a "Federal Special Services Program" designed specifically for the disadvantaged graduate student and flexible enough to support any of the current programs and future new programs developed.

- WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students. Phyllis W. Watts, chairman

  Graduate Education and Ethnic Minorities

  Western Interstate Commission for Higher Education. Boulder, Colorado. February, 1970.

  The report of the Western Association of Graduate Schools--Western Interstate Commission on Higher Education Committee on Graduate Education of Ethnic Minority Students gives a broad overall analysis of the efforts being made to repair the deficits existing in adequate educational opportunities for these persons. Problems existing are discussed citing USOE data indicating that dropout rate of nonwhites is double that of whites and that minority students are usually five years behind by the twelfth grade. The various scholarship and fellowship programs that have been developed to remedy these problems are discussed: the Ford Foundation Doctoral Fellowship program, the Southern Fellowship program, the National

Endowment for the Humanities program, the Rockefeller Foundation programs, and the programs developed at the University of California at Los Angeles with the cooperation of the Danforth Foundation. Centers for Ethnic Studies in existence or planned are listed, with the suggestion that Foreign Area Studies programs and experience in the last 15 years provide a usable model on which to build and expand United States ethnic studies programs.

A D M I N I S T R A T O R S A N D F A C U L T Y

ATTITUDES, FUNCTIONS AND ROLES

● Brown, David G.

The Mobile Professors

American Council on Education. Washington, D. C. 1967.

This book, based on two reports prepared by the author for the Office of Manpower, Automation and Training of the United States Department of Labor, summarizes a study based on information supplied by 2,000 college presidents and a nation-wide sample of 13,000 college teachers in their first year on a job. It discusses why, how, and where professors move within the academic labor market and how college teaching positions are found and filled. Data on the percent of doctorate and master's degree holders who enter teaching are given within field breakdown. The study discusses the many reasons the academic market is not perfectly competitive, suggests a wage employment theory, and makes twenty-five recommendations for more effective utilization of the academic labor market. The major recommendations are: a journal of academic vacancies; an academic register; centralized, automated procedures for making readily available information on a fee basis; a brochure on how to find a job prepared for wide distribution; placement services by professional groups; and more recruiting trips to campuses.

● Garrison, Roger H.

Junior College Faculty: Issues and Problems

American Association of Junior Colleges. Washington, D. C. 1967.

This paper identifies some of the current issues and problems affecting the junior college faculty members and the development of the junior college system in the United States. The basic controlling policies of the junior college institution have been dictated by groups and agencies outside faculty control; neither the faculty nor the institution has had much screening control over the students admitted, and the institution has little tradition or identity. Junior college teachers feel lack of adequate funds, have little professional identity and have little time to keep up in their fields; few members hold specific preparation for junior college teaching. A National Committee for Junior College Faculty, summer institutes, and work shops are recommended.

● Graham, Patricia Albjerg

Women in Academe

Science, Volume CVXIX, No. 3952, 1284-1290, September 25, 1970.

The author reviews the historical role of women in academic life, the current situation with possible explanations of the status, and offers remedial measures. She points out that universities and colleges currently beset with the many other problems and protest movements are in for another round of crises--this one dealing with the "Woman Question," and suggests that in view of the laggardness of feminine militancy on the campuses to date, university administrators still have the opportunity to act to improve the status of women on their campuses before being confronted by demands. Graham suggests several corrective measures, including removal of cultural biases, part-time professional appointments, maternity leaves and day care centers for women, and improvement of salaries, tenure and role of women.

● Heard, Alexander

Architect or Ostrich

Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 40-47. December, 1963.

The author urges graduate deans to assume leadership for the future of graduate education in order to control its exploding growth. After tracing the reasons for this rapid growth and indicating it will continue, Heard cites the changes inherent in this growth--the loss of quality and the tendency toward over specialization which would defeat the purpose of graduate education.

● Heiss, Ann M.

Today's Graduate Student--Tomorrow's Faculty Member

AAUP Bulletin, Volume LV, No. 4, 452-454, December, 1969.

Responses obtained in this study, conducted in 1969, indicate that new and prospective faculty members opt for change in the university, even for radical change in some areas. Although these new faculty members respect what the university stands for and are not bent on uprooting the system, they want to see the system structurally modified and substantively strengthened as a center for learning. The report stresses the need for humanizing the program, the need for improving faculty-student interrelationships, and the unionization of teaching assistants.

● Heiss, Ann M.

The Utilization of the College and University Teacher

Center for Research and Development in Higher Education, University of California, Berkeley. 1968. (Mimeographed.)

The role of the teacher in higher education has changed from one of isolation from society and its problems to one of greater involvement. Until recently, the great majority of faculty believed their primary role was to seek basic knowledge of the needs of mankind and to educate those who would effect social improvement. Universities are in a period of change and much of the planning for change will involve faculty time. The stress on research has not been the cause of bad teaching, as 85 to 90% of college teaching is done by nonresearchers. Basic research is the purpose of the university and the health of the nation; it should not be restricted even if some abuses do occur. However, teaching deserves some of the rewards of research. Several remedies and basic issues for better utilization of faculty are: more use of full-time research staff in teaching; a more interdisciplinary orientation of faculty; more use of innovative tools and media to free faculty to supervise independent study, seminars, tutorial and personal guidance; more emphasis on learning than teaching; programmed learning for individual progress instead of definite time periods or stages; reform of grading and credit practice; bolder, more imaginative innovations at the doctoral level; and programs such as the D.A. to train adequately new college teachers.

● Ingraham, Mark Hoyt

The Mirror of Brass

University of Wisconsin Press. Madison. 1968.

This is a study of the compensation and working conditions of college and university administrators, and as such is a special study of the Commission on College Administration of the Association of American Colleges. Over 6,200 administrators from 877 institutions responded to the 1966 questionnaire. Salaries vary widely from private institutions to public institutions; in general they are considered to be too low. The president's salary limits the salaries of those below him; and although most presidents did not complain about their salaries, most thought, and data indicates, that their salaries should average about twice that of the average nine-month salaries of professors. Backgrounds and characteristics of presidents and graduate deans are described and the conclusion is reached that they are overworked and underpaid. Four items of prime importance--salary, retirement provisions, facilities for effective work and a congenial atmosphere for one's work--all need improvement to attract able administrators.

- Lipset, Seymour Martin, and Everett Carll Ladd, Jr.

  . . . And What Professors Think

  Psychology Today, Volume IV, No. 6, 49-51, 106, November, 1970.

  Findings of this survey, sponsored by the Carnegie Commission on Higher Education with the cooperation of ACE in the spring of 1969, indicated that only 3% of the faculty approved of radical student activism, and that more than 80% agreed campus disruptions by militant students are a threat to academic freedom. However, a majority of the professors concurred with the general objectives of student activists with regard to national policy and Viet Nam and favored many of the changes demanded on-campus as being broadly desirable.

- Logan, Albert A.

  PhD Surplus Seen Benefiting Faculty Unions

  The Chronicle of Higher Education, Volume IV, No. 38, August 31, 1970.

  The apparent surplus of Ph.D.'s is restricting the mobility of faculty to improve promotion or salary increases; this is encouraging the unionization of college and university faculties, according to the American Federation of Teachers (AFT). AFT had over 200 locals chartered by 1969 with unionization activity in California, Massachusetts, Michigan, and New York expected to accelerate in the fall of 1970. Kugler, Chairman of the Union's College and University Committee, believes that faculty will be motivated to organize and unionize in order to protect themselves against reactionary forces--particularly in the area of academic and personal freedom.

- Nichols, Roy F.

  The Ambiguous Position of the Graduate School Dean

  The Journal of Higher Education, Volume XXX, 123-127, March, 1959.

  Nichols laments that, by most definitions, neither the graduate school nor the graduate dean is a school or a dean with the traditional organization, responsibilities, and authority of other schools or colleges. The reason for this is largely historical and it is surprising that the system works at all. He suggests and discusses five possibilities for improvement: a separate budget for the graduate school, the creation of a partnership between the graduate dean and the liberal arts undergraduate dean with joint responsibilities and authority, adjustment of teaching loads to reflect graduate level involvement, special funds for pioneering experiments, and creation of a new place for the graduate dean in the academic hierarchy.

- Orgel, Stephen, and Alex Zwerdling

  On Judging Faculty

  The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 217-241. 1966.

  This article deals with the teaching load versus the time used in research. According to Orgel, a good teacher and his ability to inspire students, is dependent upon his research and that of others.

- Schier, Richard F.

  The Problem of the Lumpenprofessoriat

  AAUP Bulletin, Volume LVI, No. 4, 361-365, December, 1970.

  College administrators will place greater insistence on the Ph.D. for appointment and continued employment as a result of the surplus of teaching personnel available with the Ph.D. The ABD's (concentrated in the social sciences and humanities), and the group mainly supporting radicalism and educational reforms will be disproportionately eliminated from the faculty in the potential cutbacks ahead. This will soon force a confrontation led by the student activists and coached and encouraged by their threatened faculty allies. Outlook for peace on the campus is bleak in view of the opposing forces.

- Wilson, Robert C., and Jerry G. Gaff

  Student Voice--Faculty Response

  The Research Reporter, Volume IV, No. 2, 1-4, 1969.

  Information on the attitudes of faculty members toward student participation in campus governance, obtained from a questionnaire sent to over 1,500 faculty members at six different types of colleges and universities located in three states, is presented. Results based on a 70% response rate indicate: about 2/3's of the faculty favor giving students responsibility for their own social rules and regulations, 60% favor allowing students some voice in academic affairs and 4% favor no voice in these matters, 36% believe that students should have a formal role by allowing vote on academic matters only and 9% advocate an "equal vote with faculty," but most faculty fall between the two extremes. It was concluded that faculty will have to share more academic power with students in the future; unless this happens, conflicts and confrontations over academic issues will increase.

GOVERNANCE

- Corson, John J.

  Governance of Colleges and Universities

  McGraw-Hill Book Company. New York. 1960.

  This book, in eight chapters, discusses the problems and the six broad categories of decisions that must be made and are inherent in running an academic institution. Bound by traditional practices that are no longer adequate, all members of the academic enterprise must find ways to solve the problems and tasks which must be faced in the next ten to 15 years. Problems that are caused by increasing enrollments, expanding facilities and the need to meet changing social unrest are reviewed. Administration of an educational institution is compared to administration of other enterprises, the university being unique because of its widely dispersed and distributed functions and units. The author describes the characteristics of the academic enterprise that dictate the kinds of governance that should prevail in the future. Analysis of those institutions that are successful suggests the pattern for survival.

- Kerr, Clark

  Governance and Functions

  Daedalus, Volume XCIX, No. 1, 108-121, Winter, 1970.

  Kerr reviews the history and evolution of academic governance in the United States that relies heavily upon four features (a board of governors, a strong president, monolithic nature of the campus, and important external but nongovernmental forces) in contrast to the dominating influence of faculties and governments outside the United States. Changes taking place in this system are outlined; the changes required are those the public abhors, and those the public favors are anathema to the campus. Kerr suggests that there are no permanent solutions to governance problems because the institutions and their problems are constantly changing; he proposes a clear pragmatic approach where governance problems are best handled function by function.

- Panel Discussion: Vanderhoof, John D., moderator; Julian S. Ansell, Robert D. Clark, Arturo G. Ortega, and Connell F. Persico, panel members

  Who Should Be in Charge of the Restless Campus? Why?

  Report of a Legislative Work Conference on Higher Education. Western Interstate Commission for Higher Education. Boulder, Colorado. 25-34. February, 1970.

  This is a report of a Work Conference, sponsored by WICHE in February of 1970, and reflects the differing opinions represented by a member of

a Board of Regents, a university president, a professor and a student. Major views expressed were: regent--sharing responsibilities of governing is most successful, but ultimate responsibilities reside with the governing board; president--agrees that governing is mutual responsibility of public, trustees, administration, faculty and students, but the role of each should be defined and restricted; professor--discusses traditional role and goals of the faculty and stresses interaction of administration, faculty and students through an effective faculty organization; student--expresses conflict between corporate and political power values and those of education and the institution being perpetuated by "noneducator" members predominating on boards.

- Shils, Edward

  The Hole in the Centre: University Government in the United States

  Minerva, Volume VIII, No. 1, 1-7, January, 1970.

  The author, a British writer, gives an overall analysis of the problems and crisis faced by American educational institutions in the 1960's. He blames the declining power of the administrators of universities and the rising power of the autonomous departments for creating a vacuum of leadership and authority. The faculty failed to respond to the crisis as did the presidents and deans. Author recommends the creation of a coherent and responsible senate or council of the regular teachers to counterbalance a strong president--which, he concedes, is needed.

S T R U C T U R E A N D F U N C T I O N S

STRUCTURE

External Cooperation

- Benezet, Louis T.

  College Groups and the Claremont Example

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 199-203. 1965.

  The author describes the unique structure of the Claremont Group and its reasons for existing. This loose federation of individually autonomous institutions provides a college community for the student which, while remaining small, still offers the opportunities for study and exposure that normally would be found only in a large university.

- Borman, Alvah K.

  Cooperative Education Moves Up to Graduate Study

  Journal of College Placement, Volume XXVIII, No. 2, 97-98, 100, 102, 104, December, 1967-January, 1968.

  Graduate cooperative education offers unique opportunities and benefits to students, industrial or business concerns, and the universities. Initiated at Northwestern, other universities, notably Cincinnati, Drexel, Detroit, Pratt Institute, and Adelphi have developed graduate cooperative programs. Other institutions now having undergraduate cooperative programs are planning to extend their programs to the graduate level.

- Federal Council for Science and Technology. Committee on Federal Laboratories

  Catalog of Federal Laboratory-University Programs and Relationships

  U. S. Government Printing Office. Washington, D. C. August, 1969.

  This catalog describes cooperative programs that have been developed between Federal scientific laboratories and academic institutions and provides lists of organizations engaged in these programs. It gives an account of the types of cooperative programs, their educational objectives and needs, and how they are met through the joint efforts of the laboratories and the universities.

- Fey, John T.

  The New England Board of Higher Education

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 196-198. 1965.

  The New England Board on Higher Education (NEBHE) is characterized and contrasted to SREB (Southern) and the Western Board as being: a voluntary compact composed mostly of private institutions succeeding in many voluntary contracts, mainly in the health fields; it lacks the political force and binding legal agreements of the other Regional Boards.

- Gaff, Jerry G., and Associates

  The Cluster College

  Jossey-Bass, Inc., Publishers. San Francisco. 1970.

  This is a collection of papers, summarized in ten chapters, which describes conditions in universities and higher education that have spawned the interest of educators in the development of the cluster college concept: the rise of the large multiversities with huge enrollments; the ascendency of the graduate school as the primary focus of the university--often at the expense of undergraduate education; and the difficulty of the small liberal arts college in surviving rising costs, attracting students and providing research facilities and programs in order to retain faculty. Solutions to these problems have produced experiments (about 50 have developed during the 1960's) with cluster colleges consisting mainly of two principal types--the subcolleges and the federated colleges. Problems, examples and case studies, successes, and attempted solutions are discussed.

- McConnell, T. R.

  The Coordination of State Systems of Higher Education

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 129-140. 1965.

  This essay concludes that voluntary coordination is inadequate and that there must be a coordinating body charged with planning a comprehensive statewide educational program for public institutions--with private institutions consulted and asked to participate in planning. The British Education Report of Lord Robbins is cited as an example wherein the University Grants Committee serves as a buffer between the institutions and government for funding.

● Messersmith, James C.

Consortia and Related Interinstitutional Arrangements

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 142-154. 1965.

This is a discussion of the many varied cooperative ventures between universities, with industry or private research institutes, or with foreign institutions. Much is going on, but author feels more publicity should result from it and perhaps a more formal type of contract between the cooperating agencies should be instituted.

● Stewart, Blair

Cooperation by Small Groups of Liberal Arts Colleges

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 207-210. 1965.

Blair describes the function of the Associated Colleges of the Midwest--a group of ten liberal arts colleges averaging about 200 miles apart, which has joined together to increase educational activities and to minimize costs that would result from duplication of efforts. The pact has been made necessary by the rising costs of education and was formed with the hope that good liberal arts education can be rescued from the evils of ever-expanding, huge "Federal Grant Universities."

● Wenberg, Stanley J.

State and Federal Legislative Relations

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 282-285. 1965.

This essay comments on the relationships of State and Federal governments to the university. The author advocates that the university should take a leadership role in establishing that planning or ideas originate in the institution and that "aid" is not thrust upon them without consideration of the effects of it on the institution. Closer relationships to Congressmen and legislators are needed.

Growth, Changes and Distribution

(Community Colleges, Junior Colleges, Liberal Arts Colleges, Sectarian Colleges and Universities)

● Alexander, W. Boyd

England's New Seven: An American View

The New University. John Lawlor, editor. Columbia University Press. New York. 25-48. 1968.

This is an account of the seven "new universities" and the guidelines for their planning and establishment as authorized by the University Grants Committee (UGC) in the late 1950's following the Robbins Committee Report. The UGC set up eight guidelines as to the institutions' objectives, location, organization, scope and support and concluded that the Robbins Report underestimated long term needs; yet, because of financial difficulties, the British government announced its intention in 1965 to establish no new universities for ten years. The author reviews Lord Fulton's questions concerning the "new universities" in New Universities in Perspective: where they should be, how big they should be, what and how they should teach and contrasts British and American educational systems and universities.

● Axelrod, Joseph

New Patterns of Internal Organization

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 40-61. 1965.

In this essay, Axelrod outlines the new patterns and changes in higher education since the 1950's; emphasis is given to the effect of Federal funding on the junior colleges, the four-year liberal arts colleges, the graduate schools, and the professional schools. The main theme stresses the rejection of the old organizational patterns of the mid-fifties and the emergence of structural and curricular changes in the sixties.

● Baskin, Samuel, editor

Higher Education: Some Newer Developments

McGraw-Hill Book Company. New York. 1965.

This volume was prepared as background to the Twentieth National Conference on Higher Education and is a compendium by twenty authors and the editor. It deals with the many factors contributing to the current ferment bringing about badly needed changes and reform and focuses primarily on the four-year liberal arts college. The population and college-age upsurge, the revolution in science and technology, rapidly rising costs and the demands for more and better educated

people are all stimulating the ferment underway. Some of the newer developments are: the establishment of small autonomous colleges within universities, the use of the dormitory as a center of learning, and the growth of new programs and teaching methods. The latter begins with seminars at the freshman level, special honors programs for the abler students, year-round study, growing use of news media and technology, extramural and off-campus experience and independent study, the three-year master's degree starting in the junior year, and the use of shared facilities by universities through interinstitutional cooperation and compacts. Institutions have long been criticized for resistance to change but there is evidence that new approaches and developments are being put into practice in both public and private schools.

- Bowdoin College

The Development of Doctoral Programs by the Small Liberal Arts College

Proceedings of a Symposium. Bowdoin College. Brunswick, Maine. April, 1967.

These proceedings describe five sessions devoted to the development of doctoral programs by small liberal arts colleges. Summarized are: the major papers; the discussions; and the advantages, disadvantages, and implications of developing doctoral programs. The experiences gained at other liberal arts colleges are presented by the various participants from the overall institutional viewpoint and in terms of individual disciplines. Future implications for the small liberal arts colleges in the graduate arena are reviewed and the general conclusion, although not unanimous, was that expansion of doctoral programs should be viewed with caution by this type of institution.

- Burn, Barbara B., et al.

Higher Education in Nine Countries: A Comparative Study of Colleges and Universities Abroad

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1971.

Authored by Barbara B. Burn for the Carnegie Commission on Higher Education, this book is a comparative study of colleges and universities abroad in eight industrial nations and one lesser-developed nation: Great Britain, France, Canada, Australia, West Germany, Japan, Sweden, the U. S. S. R., and India. A chapter on an evaluation of national systems of higher education and a concluding commentary are contributed by Clark Kerr and James A. Perkins, respectively. Data are provided on institutional structure, organization and governance, relationships of institutions to civil governments, financing, student assistance and student organizations, enrollment trends, and prospects for future development. The study concludes that despite differences in local customs, cultures, political systems, and social structures, institutions universally share a common heritage, are evolving in the same general direction and are beset by many of the same problems, including student activism. Kerr ranks the countries on the basis of eight tests, and finds wide variability in the scores. Perkins suggests that the United States would do well to study the strengths existing in other nations, particularly in the areas of coordination and the role of the national government.

- Cooke, W. D.

  Some Questions on the Future of Graduate Education in the United States

  Cornell University. Ithaca, New York. August, 1969. (Mimeographed.)

  This report indicates that much thought must be given to the implications of an expansion of graduate education. This enhancement of academic status is encouraged by society, academic institutions, faculty, and students (although not always for compatible reasons). The author feels that Federal agencies should be careful about encouraging the growth of new institutions as it sometimes dilutes the strength of existing institutions. He also feels that graduate students are in short supply and that universities compete for them. Another important factor that must be considered in future plans is that, in many areas, the supply of new doctorates is outstripping the demand for their services. Under such circumstances, it might be reasonable to expect that part of the student's expenses be borne by the institution and part by the student. Estimates of the future costs of financing graduate education have become so large that they must now seriously compete with other programs for funds. Unless the academic community is willing to set its own priorities, it may well lose an input on the decisions that will have to be made.

- Eurich, Alvin C., et al.

  The Expansion of Graduate and Professional Education during the Period 1966 to 1980

  Studies in the Future of Higher Education Report No. 2. The Academy for Educational Development, Inc. Washington, D. C. 1969.

  This study, conducted in 1967 under contract with NIH, NSF, OE, and the Bureau of Health Manpower, involved visitation to 149 universities selected to represent diverse types and those apt to change substantially in graduate and professional education over the next 15 years. The study centered around four main questions: identification of institutions most likely to expand, plans and programs for this, effects of state systems' plans and financing, and role of the Federal government. Major conclusions were: universities everywhere plan for substantial expansion in next 15 years; the bulk of the expansion will be in public institutions, urban universities are expecting a more rapid rate of growth than other institutions; most plans call for new programs and expanding old ones, but specific plans, costs, or financing are usually not developed. Report recommended that Federal officials and agencies require universities, as a condition for a grant or loan in excess of $0.5 million, to prepare and document detailed yearly needs and plans for the next ten-fifteen years.

● Greeley, Andrew M.

From Backwater to Mainstream: A Profile of Catholic Higher Education

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1969.

As the first of the series of educational profiles by the Carnegie Commission, this book in nine chapters traces the origins and developments of the Catholic institutions of higher education in the United States, pointing out the historical trends, their special atmosphere and roles, statistical data about them, their goals and functions, results of their efforts including alumni careers, special problems, case histories of selected schools and future prospects. The concluding commentary is by David Riesman, a member of the Carnegie Commission; references and a listing of Catholic instituions, by state, are appended. It is concluded that their similarities are not as remarkable as their diversities. Despite difficult questions about the future of these institutions, it is doubtful that they will cease to be, but they must be made a more meaningful and significant part of American higher education without sacrificing their unique and valuable roles. In large part their future depends on the revolutionary changes taking place in the Catholic Church itself and what influence the Catholic institutions exert upon the Church during a critical period of evaluation.

● Harris, Seymour Edwin, et al., editors

Challenge and Change in American Education

McCutchan Publishing Corporation. Berkeley. 1965.

This volume resulted from papers and discussions presented at a Seminar held at Harvard University Graduate School of Public Administration in 1961-62. Government officials, presidents, deans, business officers, and professors contributed to the Seminar. Topics centered around: the Federal government and education--State vs. Federal control in disbursing and controlling the use of funds; educational lobbies and Federal legislation; Federal expenditures on research; general vs. vocational education; challenges in educational planning--how to measure talent, creativity, and traits for future success; who should receive financial support; management of colleges and universities; graduate education in the arts and sciences; and economic studies in relation to education--particularly the rising cost of graduate education.

● Harrison, Wilfrid

Some Problems of New Universities in England

The New University. John Lawlor, editor. Columbia University Press. New York. 49-75. 1968.

This essay describes the development of the new universities in England which were begun between 1961-1965 as a result of the Robbins Committee's

proposals. Their uniqueness, opportunities and acceptance are discussed in some detail. Although many problems exist in shaping the outcome of the universities, challenges are offered to the persons involved.

- Hefferlin, JB Lon

Dynamics of Academic Reform

Jossey-Bass, Inc., Publishers. San Francisco. 1969.

This report stemmed from a four-year study of "institutional vitality" defined as the institutional capacity to continuously reorganize its programs and redistribute its resources in ways to encourage and maintain promising innovations and changes. The study sought to understand the forces that effect educational change to stimulate, hopefully, more academic reform. In doing so it followed three distinct directions: development of a questionnaire, "Institutional Functioning Inventory"; survey of existing information on organizational change in general, and academic change in particular, using 16 case studies; and the testing of academic reform on a randomly selected, stratified sample of 110 American colleges and universities. The overall conclusions were that changes and different reactions to educational opportunity result from multiple causative factors and no single factor governs differences among institutions; without potential reward, change is unlikely. Change occurred most frequently: at institutions which, among other factors, were the most dependent upon student enrollment for financial support; at institutions located in urban areas where social changes had necessitated institutional changes; and at undergraduate institutions that were independent of universities dominated by graduate departments. Most reforms resulted from outside pressures and influences.

- Kerr, Clark

The Frantic Race to Remain Contemporary

The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 19-38. 1966.

The rapid growth, shifting academic emphasis, involvement in the life of society, involvement with the Federal government, and future changes in universities in the 1960's and beyond are discussed. The production, distribution and consumption of "knowledge" account for 29% of the GNP; industry and universities are becoming more alike physically and psychologically. The improvement of undergraduate education, the need to create a more unified intellectual world, the preservation of a margin of excellence in a populist society, and a more direct relationship of administration to individual faculty and students in the massive institutions are viewed as needed future changes yet to be realized.

- Knight, Douglas M.

  The Future of Graduate Education in the United States

  The Educational Record, Volume XLVI, No. 2, 129-131, Spring, 1965.

  Knight makes predictions for graduate education. The increase in the number of institutions will continue but not at a rapid pace due to a shortage of good faculty and the high costs of laboratory research. Not many baccalaureate institutions will add graduate work but instead will take the challenge of the graduate school and do a better job of preparation for it. The gap likely to occur will not be between undergraduate and graduate schools but between weak and strong institutions. Graduate programs will become more intensive, less extensive, and will be accelerated. Cooperation between institutions in strong areas will fill gaps in other institutions.

- Perkins, James A.

  The University in Transition

  Princeton University Press. Princeton, New Jersey. 1966.

  Perkins' book is based on three lectures given at Princeton in the "Stafford Little Series" in 1965: "The Dynamics of University Growth," "The Search for Internal Coherence," and "From Autonomy to Systems." To a great degree it tracks and expands the Kerr lectures given at Harvard. The basic attributes of knowledge--acquisition through discovery, transmission through teaching, and applications through public service--correspond to the three missions of the modern university; these forces have affected and transformed the American university during its genesis and history. The modern university appears threatened by its own success and experts projecting the future share common fears: the fear of uncontrolled growth, the fear of loss of direction, the fear of loss of principle, and the fear of failure to adapt readily. The four fears boil down to two primary concerns: the first deals with loss of identity from external relations, and the second deals with internal cohesion and loss of legality to manage its own affairs. The university faces formidable internal problems created by growth: the compromise of integrity; the attention to its missions and their interdependence; and the struggle for optimum roles and balance of students, faculty and administration in a coordinated whole. Growth, complexity, specialization, and towering costs require coordination and create the need for planning imposed by the emergence of a hierarchy of supra-university institutions of local, state, regional, national and international interests. Central to all levels is the protection of academic freedom, the need for continuous innovation and change, and the need for coordination and planning for the modern university in transition.

- Sanford, Nevitt, editor

  The American College

  John Wiley & Sons. New York. 1962.

  This is a compendium of 29 chapters, written by various authors and sponsored by the Society for the Psychological Study of Social Issues, as

a social and psychological interpretation of higher learning. It begins with an introductory section by the editor spelling out higher education as a social problem--a field for study. The central thesis is that the scientific method provides the logical basis for intelligent change; for change based on systematic knowledge rather than on improvisation, hunch or dogma is the answer to future problems. Although colleges and universities have been relative laggards to date in understanding and evaluating their functions, such considerations will be required to meet present and future challenges and needs. Intermediate sections on the entering student, academic procedures, student society and culture, student performance in relation to educational objectives, interactions of student and educators, the effects of college education and higher education, and the social context are presented. The book concludes with Riesman and Jencks' essay on the "Viability of the American College"; the closing epilogue by the editor embodies recommendations and proposed changes for research and policy in higher education.

Internal Cooperation, Coordination, Organization and Reorganization

● Aronoff, Sam

Interdisciplinary Scholarship

Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 90-96. December, 1969.

Aronoff presents a philosophical discussion organized around the interdisciplinary nature of knowledge, the question whether multidisciplinary programs will require restructuring in the university, and the uniqueness of the horizontal structure in the social sciences. The current concern for interdisciplinary efforts largely results from the increasing demand that our academic institutions, having been the primary force of the material structuring of civilization, also be the vehicle for the delineation and analysis of solutions of its ills. The university can restructure its educational system if it is willing to undergo drastic reorganization in its own structure. The demand for these programs comes primarily from sources external to the university wanting research in a specific resource or problem.

● Council of Graduate Schools in the United States

The Organization of Graduate Work within the University

Council of Graduate Schools in the United States. Washington, D. C. September, 1967.

This is one of several booklets issued by CGS relating to graduate work, degree programs and standards. It spells out guidelines for initiating and maintaining high standards for quality graduate education, organization of the graduate school, role of the dean, staff requirements for the dean's office, budget required for his operation including student and faculty support, and other necessary factors and requirements.

● Crawford, Bryce L., Jr.

The Support of Interdisciplinary and Transdisciplinary Programs

Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 81-87. December, 1969.

Crawford's paper, as a part of the plenary session devoted to this topic, reviews the Minnesota graduate school organization as related to support of inter- and transdisciplinary programs and stresses that the trouble source is interdepartmental cooperation since departments are the practical budgetary units. Normal departmental mechanisms cannot be relied upon to supply the initiative needed in regard to interdepartmental programs. There must be a transdepartmental referee or system of referees, usually the graduate dean and the arts college dean or the academic vice-president with control over budget and position allotments after evaluation and recommendation of appropriate faculty committees, to exercise the velvet glove and the iron hand. With practical control mechanisms, the nature of scholarship will lead to shared problems, merging interests, and new patterns and alignment of cooperation.

● Dressel, Paul L., et al.

The Confidence Crisis: An Analysis of University Departments

Jossey-Bass, Inc., Publishers. San Francisco. 1970.

Departmental structure in universities and their operations are analyzed, their conflict with the goals of the university and the administration are discussed, and the question of whether the university could be better organized on the basis of functions rather than disciplinary-based departments is raised. Procedures for conducting university and departmental evaluations are suggested and the need for a management information system upon which to base planning and budget allocations is pointed out. The conclusion reached is that university organization needs reform. Practical ways to achieve this are outlined, especially in service and applied research functions; centralization of functions along program-planning-budgeting procedures and into larger organizational units such as schools, centers, and institutes where responsibilities and functions are integrated along interdisciplinary and multidisciplinary common interests, is recommended.

● Hodgkinson, Harold L.

Institutions in Transition: A Study of Change in Higher Education

Carnegie Commission on Higher Education. Berkeley. 1970.

This 169-page report, produced jointly by the Carnegie Commission and the Center for Research and Development in Higher Education at the University of California, Berkeley, makes no formal recommendations, but analyzes USOE data (1947-1966) and information collected in a survey of about half of the presidents of United States colleges and universities. Data and observations

in the report support the following: a "monolithic" system pervades virtually all United States higher educational institutions based on specialization of interest and competence in a discipline, that students and faculty are rewarded as they attain higher levels of specialization, that diversity is a declining force and institutions are becoming more and more alike except for size, and the community college is caught in the middle of the system and may find itself at the lowest end unless it can develop its own curricula and appeal to faculty and students. The present system is more "racially" open than in the past but higher education is fundamentally for the "middle class" with little dedication or opportunities for the changes needed; open admissions may be the next step for some institutions with junior colleges serving as the "bridging institution" between society and higher education. Other changes noted are (in rank of importance): change in internal authority; changes in student body composition; institutional concerns; changes in interests and type of faculty; changes in administration, finances, physical plant, external authority; and change toward predominantly coeducational institutions.

- Panel Discussion: Prior, Moody, chairman; Frank L. Hereford, S. D. S. Spragg, panel members

The Internal Articulation of Graduate Schools

Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 128-138. December, 1963.

In a panel discussion, chaired by Dean Prior of Northwestern University, of administrative organization for graduate schools, Dean Spragg of the University of Rochester described their graduate council which serves as a policy board to set new standards and policies for the Ph.D.: each college has a dean and an associate dean for graduate work; faculty is composed of both graduate and undergraduate members; funds for graduate and undergraduate work are administered through the dean; head of the council is a dean, but he has less power than the traditional graduate dean. Spragg believed such a system was generally good; however, it should include control over the awarding of master's and professional degrees. Most professional degrees are awarded by the individual schools. Dean Hereford, University of Virginia, described the organization at the University of Virginia: loose junction of departments headed by a dean; no budget, per se, for the graduate school--each department has own funds; admission for graduate work made by the dean who consults with departments; and professional degrees awarded by the individual schools.

- Rossi, Peter H.

Researchers, Scholars and Policy Makers: The Politics of Large Scale Research

The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 110-129. 1966.

This chapter concerns itself with the effects of the development of research centers, primarily in the social sciences, upon university organization: why research centers evolved, their role in comparison to that of a department, how they are funded, how they contribute to the student, and the implications for the contemporary college and the scientific researcher.

- Spurr, Stephen H.

  Changing Patterns in Graduate Education

  Changing Patterns in Graduate Education. Highlights from papers presented at CRDHE's Conference on Higher Education, St. Louis, October, 1970. The Center for Research and Development in Higher Education. Berkeley. 9-13. 1970.

  This paper involves the discussion and conclusions reached on five topics: curriculum changes with interdisciplinary programs prospering in the future and faculty organization eventually being revised to conform to these programs; academic degrees comprising three phases--the two-year masters, an intermediate Ph.D. of not more than two additional years of work, and the higher doctorate certifying scholarship and independent research of proven ability; the certification process wherein internal certification can be complemented by external world for self education; organization revolving around the graduate dean as the faculty-wide representative who speaks the academic conscience of the university; and financing that recognizes the national character of graduate study with support both to graduate schools and directly to graduate students.

- Union for Research and Experimentation in Higher Education

  Dimensions of Change in Higher Education: First Workshop Conference to Foster Innovation in Higher Education

  Union for Research and Experimentation in Higher Education. Magnolia Manor, Massachusetts. May, 1966.

  This conference consisted of a series of addresses and of seven workshops at the Educational Resources Information Center of HEW on the general theme of "Dimensions of Change in Higher Education." The main addresses were: "Experimental Colleges in America"; Some Current Experiments: Four New Colleges and Their Programs: "The Experimental College at Berkeley," "The Library-College: Prospects for Jamestown," "Justin Morrill College at Michigan State University," "Oklahoma Christian College"; "Materials for Better Learning: An Educational Service"; "Attacking the Issues"; and a closing address on the need of innovation and some directions that such innovation might take. The workshops reviewed individual experiences at different institutions in the realm of new innovations, programs, changes and opportunities, as well as proposals for research and new experimentation.

- Weaver, John C.

  Some Dilemmas in Graduate Education

  A Report to the Carnegie Corporation of New York on a Travelling Fellowship, 1957-58. Graduate College, University of Nebraska. Lincoln, Nebraska. August, 1958.

  Under the sponsorship of the Carnegie Corporation of New York, Weaver surveyed a diverse group of American and Canadian universities and their

graduate schools in the late 1950's. A number of the problems encountered and the answers that have evolved are summarized with the conclusion that although one finds common problems and aspirations, institutions are unique as to attempted solutions. Graduate Schools tended to group on the basis of academic maturity, type of control and funding, and operational size rather than on other common denominators.

- Wilson, Logan

American Higher Education Confronts Its Future

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 1-5. 1965.

In this introduction to Emerging Patterns by Logan Wilson, the variety of United States institutions is described; the effects of society upon their aims, growth, and curricula are discussed; and the need for coordination is stressed. Wilson concludes that autonomy is costly due to the duplication of effort, and that unless the institutions integrate and coordinate their efforts, other controlling agencies will assume this role. The book is a series of essays in which new designs in organization and administration are presented and discussed by 34 leaders who shape policy for higher learning.

State Control, State Systems

- Coons, Arthur Gardiner

Crisis in California Higher Education

The Ward Ritchie Press. Los Angeles. 1968.

The author, President Emeritus of Occidental College, former chairman of the California Master Plan Survey from 1959-60, and President of the Coordinating Council for Higher Education in California from 1965 to 1968, is well versed to review the experience under the Master Plan and the problems of coordination in recent years. This book is important because the California Plan is often held up as the standard for others and Coons is well acquainted with both its virtues and faults. The treatise is developed logically, first giving the California education setting as background to the events that gave birth to the Master Plan, how the Survey was conducted and brought into being, its functions and achievements, the struggles and tensions, the problems at different levels (including unresolved problems), a look ahead, and attitudes for the continuing future. The Berkeley riots, failure of Kerr to act in the riots, Reagan's budget cuts, the need to get politics out of the Coordinating Committee, and other issues are discussed and analyzed. In his final chapter, Coons looks ahead to finance, governance, and future attitudes--including strong leadership in education--that are needed.

- Dunham, E. Alden

Colleges of the Forgotten Americans: A Profile of State Colleges and Regional Universities

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1969.

As the second of a series of profiles sponsored by the Carnegie Commission on Higher Education, Dunham reviews the history, development, status, roles and functions of the State Colleges and Regional Universities. These 279 institutions, basically the members of the AASCU whose history spans less than 150 years, now enroll about 1/5 of all college students and this proportion will continue to rise--they produce about 50% of the nation's teachers. Dunham proposes that they have a special role to play in the future, namely, in training for the Doctor of Arts degree, which is described in detail. As an epilogue to his proposal, the Carnegie Corporation in July of 1970 announced grants for pilot programs supporting the D.A. approach.

- Egerton, John

State Universities and Black Americans

Southern Educational Reporting Service. Atlanta. 1969.

This report surveys the effort of the National Association of State Universities and Land Grant Colleges (NASULGC) to broaden educational and professional opportunities for Negro Americans in NASULGC institutions (17 of the original all-black colleges and universities belong to NASULGC). Conclusions drawn from the survey indicate just how small the percentage of black Americans is in the major state universities and land-grant colleges; although dedicated to increasing this involvement, the larger problem of meaningful integration remains unsolved; and administrators and students are more committed to drastic changes for eliminating inequities than are the faculties.

- Glenny, Lyman A.

State Systems and Plans for Higher Education

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 86-103. 1965.

This is a discussion of State coordinating boards of institutions of higher education, their advantages and disadvantages, and evaluation of the role of different types of systems. Voluntary systems composed of presidents and university representatives to coordinate plans and budgets usually have not been effective or efficient. Single boards appointed by the Governor with a central staff and without university presidents on the council have been opposed by colleges. Glenny favors a super coordinating board, usually more acceptable to institutions, which emphasizes long-range planning and master plans and having varying powers from state to state.

- Graduate College News

  The Changing Four-Year Colleges

  Texas A&M University Graduate College News, Number 11, 1-4, September, 1970. (Reprinted from Issues in Higher Education, Southern Regional Education Board.)

  The SREB examines the changing hierarchical system of higher education in the South, highlights current problems, and offers possible solutions. The diverse patterns of how the different states attempt to answer the pressure for expansion and change, the characteristics and needs of the students, the problems of developing graduate work, and the role of coordinating agencies in controlling the location, nature and financing of state colleges and regional universities are discussed with recommendations made for their solution.

- Heimberger, Frederic

  The State Universities

  The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 51-76. 1966.

  This article discusses the expansion and realignment of the state universities. The problem lies in realigning their interests and efforts in order to meet newer needs and broader opportunities of a changing social and economic order. The article states that the financial needs are so great that leaders must seek support from every respectable source. Solution to the enrollment and financial problems must be sought and found by the university, either by expansion or by creating new institutions--ultimate decision rests mainly with the state legislatures.

- King, John E.

  Changes in the State College System

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 74-78. 1965.

  This essay discusses the emergence of state colleges from normal and teachers colleges to the broad role they have attained today. King predicts that they will enjoy further expansion and that tax-financing will not be a barrier. Hopes for the future are expressed that these colleges will continue to make possible universal opportunity for education beyond the high school, that they will always be committed to teacher education, and that their growth will be in harmony with junior and private colleges which are also needed.

● Wilson, Logan

Emergent Challenges: The State University of the Future

The Graduate Journal, Volume II, Supplement, 177-192, 1959.

Wilson reviews the structure and functions of the state university as a social institution and the social and critical factors that have brought it to its present state. As opposed to the private institutions, the distinguishing features of the state universities are their methods of support and control and less independence in their research and public functions. Wilson predicts for these institutions: great challenges for the future; rapid expansion in enrollment and functions taking place mainly through satellite campuses; main campus will emphasize upper division work, graduate and professional schools; and their students will become less heterogeneous but the faculty more so. Better organization, planning, and the role and control of coordinating boards will become a necessity; many of the trade-school functions will be shifted to other groups.

FUNCTIONS

Admissions Mechanisms, Curriculum and Grading

● Burns, Richard L.

Graduate Admissions and Fellowship Selection Policies and Procedures

Part I. Graduate Record Examinations Board. Educational Testing Service. Princeton, New Jersey. 1970.

The results of a GREB questionnaire survey of the graduate admissions and fellowship selection policies and procedures of the 287 members of CGS are presented. The returns, representing an 85% response rate of usable replies, were analyzed by: total group; high Ph.D. institutions, those granting at or above the mean number of Ph.D.'s granted in 1967-68; low Ph.D. institutions, or those granting below the mean number of Ph.D.'s in 1967-68; and institutions granting master's degrees only. Some questions were analyzed in terms of the broad fields of humanities, social science, and science. Some of the major findings are: some overall admissions policy exists in almost all graduate schools, with the larger Ph.D. group having a more competitive policy and the master's-only group tending to have an open-door policy; 87% of the high Ph.D. institutions report the use of admissions quotas, but only 32% of the master's-only have quotas; in descending order, the five most important admissions criteria used are college transcripts, completed application forms, GRE Aptitude Test scores, letters of recommendation from undergraduate faculty, and GRE Advanced Test scores; most graduate schools make very little use of data processing equipment--when used, it is mainly for record keeping and the development of statistics; however, 40 indicate use of data processing equipment will be a major need over the next five years; 3/4's of the schools do not involve students in establishing policies or procedures or in the selection process--when used they serve mostly as advisors;

more students are supported in science than in humanities and social science in all types of institutions; and, need vs. merit in awarding fellowships varies markedly by the type of institution--the primary criteria in the larger schools is merit. Minority group admissions, policy and procedure developments, evaluation of student backgrounds, and pressure for open admission vs. need to maintain standards are the most cited admissions problems in the next five years. The graduate schools indicate that the future services desired from the GREB during the next five years are improvement in current tests and services and development of new tests and services.

● Burns, Richard L.

Projected Plans for Changes in the Graduate Record Examinations

Proceedings Twelfth Annual Meeting. Western Association of Graduate Schools. Seattle. 78-84. March, 1970.

A five-year program involving restructuring and major modifications in the Graduate Record Examinations, approved by the GREB beginning in 1970 and projected to be completed by 1975, is described. A modular approach to the test design for both the Aptitude and Advanced Tests to allow for maximum flexibility is proposed. The tests will continue to offer a total score and to allow for subscoring when desired. Much of the detail in selecting the options remains to be worked out in consultation with the Committee of Examiners and with the help of consultants from the various disciplines. The basic philosophy guiding the proposed redesign is to permit maximum accommodation of the needs of graduate admission and selection, placement, guidance and discovery, through a national program.

● Doermann, Humphrey

Crosscurrents in College Admissions

Teachers College Press. Columbia University. New York. 1969.

This is a general treatise and critical review of college admissions, mostly applicable to the undergraduate level, which attempts to classify the nation's annual crop of potential college students as measured by scholastic aptitude and their families' ability to pay for the education. Based on these critera, the number of students available is much smaller than most observers have been estimating. Tables are provided, based on actual and projected data from 1955 to 1975, which can be used by individual colleges to appraise the size of their particular candidate pool when defined by their own admission practices and fee structures; four case studies are given. It is concluded that most selective and academically rigorous colleges, particularly private ones, are sharply narrowing the effective pool of candidates by their practices and charges. This indicates that public institutions will expand unless present systems of support or admission practices, or both, change drastically.

- Graduate Record Examinations Board

  Case Studies of Graduate Admissions and Fellowship Selection Policies and Procedures

  Educational Testing Service. Princeton, New Jersey. 1970.

  The report presents detailed information about the policies, practices and procedures of six graduate schools (Claremont, Kent State, Northwestern, University of Texas at Austin, UCLA, and Yale) selected for their diversity, size, type of control, maturity and other criteria. Individual summaries of the observations of the visiting teams provide a detailed account of a complete admissions and financial aid system of the six schools and of how the systems operate within their particular framework. Although not intended as models, the case studies give possible ideas and approaches for consideration by other graduate schools in light of their own needs and institutional patterns.

- Groesbeck, B. L.

  Graduate Admissions: Are We Prepared for the Years Ahead?

  College and University, Volume XLII, 504-510, Summer, 1967.

  Groesbeck describes the overwhelming job of processing applications for admission to graduate school. At many institutions, there were almost as many graduate applicants as there were undergraduate applicants; this trend is steadily increasing. He feels that institutions are not prepared to process applications in the years ahead. Some standardizing of the system is recommended and the use of data processing is suggested. He believes the faculty should have the primary voice in the selection of graduate students.

- Groesbeck, Byron, et al.

  Selection of Graduate Students: Fact and Fancy

  College and University, Volume XLIV, 447-450, Summer, 1969.

  Sessions to provide an exchange of information about graduate school admission procedures and criteria offered an opportunity for dialogue between college admissions officials, a graduate student, and the audience in the summer of 1969. The associate dean of the Yale graduate school and the director of graduate admissions at the University of Illinois presented their schools' graduate admission procedures. A graduate student's presentation raised questions such as: can the student know that there are exceptions to published "cutting scores" on admission tests, and can he know from your admissions statement that your policy toward the disadvantaged student includes a careful remedial or tutorial program? Questions asked by the audience included: how do you evaluate pass-fail grading systems, and how do you evaluate students who have not been successful in graduate programs at other schools?

● Hillgarth, J. N.

Graduate Admissions: Havoc into Chaos

College and University, Volume XLII, No. 4, 498-504, Summer, 1967.

The author reviews briefly the history of graduate work at Harvard with emphasis upon admission and the system now in operation. The relative roles of administrators and the faculty are discussed; better cooperation and mutual trust are needed.

● Kinsman, Robert S.

Graduate Admissions: The Image of Governance

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 25-30. July, 1969.

The graduate admissions procedures at the University of California, Los Angeles are described in detail by the associate dean of the graduate division. The graduate admissions office performs the routine processing duties and passes the applications on to the departments for selection. The admissions office does have a final decision to reject those chosen.

● McDermott, Robert E.

Data Processing and Analytic Studies in Graduate Administration

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 85-90. July, 1969.

The principal uses of data processing by graduate schools to date has been for housekeeping purposes: admissions, housing, billing, loans, etc. Undergraduate programs are difficult to adapt to graduate student information problems and in-depth research should be undertaken to develop needed information on rising costs, enrollments, degrees, motivation of students and other critical problems in graduate work.

● Mehrabian, Albert

Ability Factors of Candidates for Graduate School

American Psychologist, Volume XLIV, 560-563, 1970.

The study was supported by a U. S. Public Health Service grant with 352 psychology students applying to UCLA in 1969 as subjects. The object was to delineate factors which could be used to assess a student's potential for graduate work. The author made selections of ability indexes for his study based on:

the GRE Aptitude and Psychology Advanced Test scores and MAT scores transformed into percentile scores, GPA for junior and senior years, and letters of recommendation yielding ratings for research potential and teaching, clinical work, interpersonal relations, originality, independence, mastery of course content and likability. The findings suggested four primary ability factors: the standardized test, research potential, research-orientation, and the GPA. The author proposed a regression equation for use in assessing the overall strength of a candidate based on the four factors. It was suggested that the results would be helpful in the selection process of graduate students by counteracting disproportionate reliance on any subset of these abilities in the selection process, and in suggesting additional variables that are either left out or only slightly considered in most current selection procedures.

● Rossmann, Jack E.

Graduate School Attitudes to S-U Grades

The Educational Record, Volume LI, No. 3, 310-313, Summer, 1970.

The author surveyed graduate and professional school deans as to their opinions on S-U grades for students seeking admission to graduate school. There was no enthusiastic support for S-U grades; a wide difference in opinion existed as to the effect of a high percentage of S-U grades, or what criteria should be leaned on most heavily to replace grades. The negative response of graduate schools to S-U grades suggested that undergraduate schools should seriously consider the consequences before expanding the use of this grading system.

● Snyder, Rixford K.

Developing Nationwide Standards: Admissions

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 222-224. 1965.

In order to alleviate or remove the tremendous problems now being experienced in handling large numbers of applications, it is proposed that admissions procedures be standardized. It is suggested that the following areas are in need of standardization: forms (particularly transcripts and forms used by high school counselors), selection criteria, admission dates, reply dates, procedures for handling multiple applications which create a fallout problem, and ways of handling foreign and Negro applications.

Autonomy

- Gardner, John W.

  Government and the Universities

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 286-292. 1965.

  Gardner predicts a steady growth in government-university involvement and advises educators that they have the responsibility for the health and integrity of their government and the whole society as well as for the autonomy of their own institutions. Leadership to protect this autonomy must come from the universities in the form of leaders with great awareness and statesmanlike qualities, but they must be backed up by an informed and active constituency. The strengthening of associations of educators also will help preserve autonomy and keep the universities as masters of their own fate.

- Perkins, James A.

  The New Conditions of Autonomy

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 8-17. 1965.

  Perkins states that the functioning of the modern university is intertwined with outside influences; to maintain its autonomy, the university must strengthen itself internally and preserve communication within the institution. Strong presidents are vital to the continuing autonomy of the university; they must be leaders in national planning as well as effective administrators in their own institutions. Encroachments on university autonomy are made by Federal, state and regional organizations and by foundations. To prevent usurption of its role in educational innovation, the university should budget its own funds for educational experimentation. Academic freedom is essential to preservation of the university's ability to contribute to the society. Faculty, administration and lay trustees have proved an effective buffer against muzzling influences from the outside. The universities must play a positive role in the future of higher education.

- Sims, Albert G.

  An Appraisal of the Behavior of Universities in International Education

  University, Government, and the Foreign Graduate Student. College Entrance Examination Board. New York. 49-54. 1969.

  The author feels that the university should have a role in international education but the distance between the university and the national government must be maintained. The government can provide funds to the university to strengthen it, but the threat to the university's independence arises when the institution starts to help the Federal government formulate foreign policy.

- Wilson, Logan

  Myths and Realities of Institutional Independence

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 18-28. 1965.

  The need is expressed in this essay for research into the kind and degree of autonomy our institutions require for effective operation and the kind and extent of accountability they owe society. All institutions have restraints to some degree: religious; state; if private, the need for money; and accreditation standards. The effects of Federal impact on the universities, based on a Carnegie study, are discussed: benefits include--improved research facilities, faculty benefits, help to graduate students, plant and equipment gains; disadvantages listed include--funding is too heavily imbalanced towards the sciences, it diverts institutional funds for matching funds, it encourages the neglect of teaching due to heavy research responsibilities, and it impairs the institution's traditional areas of decision making. Research on management of university administration to solve problems of autonomy and public concern is recommended.

Institutional Research

- Clark, Jere W., and Juanita S. Clark, editors

  Systems Education Patterns on the Drawing Boards for the Future

  Highlights of The Second Annual National Conference on General Systems Education. Co-Sponsored by the Center for Interdisciplinary Creativity, Southern Connecticut State College, and The Calvin K. Kazanjian Economics Foundation, Inc. in cooperation with the Task Force on General Systems Education. Cheshire, Connecticut. November 1, 1968.

  Papers given at the conference concentrated primarily on a theoretical approach to applying systems research to education, and the major themes centered around: developing common denominators for the process to identify aims and priorities, ways to assess resources, strategies to apply resources to accomplish aims, and a continual feedback at all stages to evaluate progress and modify goals and plans. The general consensus reached was that cybernetic models should be used in a general systems approach for acquiring, processing, storing, retrieving and using information; a minimum of resources should be utilized to achieve the desired goals through a programmed sequence of actions leading to the goal.

- Heiss, Ann M.

  Graduate Education Today: An Instrument for Change?

  The Journal of Higher Education, Volume XXXIX, No. 1, 1-10, January, 1968.

  Although graduate education occupies the apex of higher education for the well-known reasons, the author concludes that it faces radical change; that there is little evidence that change is taking place; and that graduate education is unsuited for present demands, much less those of the future. New institutions strain to become a Harvard or a Berkeley with no new ideas in the basic format. Heiss inventories the critical issues in graduate education and highlights 13 priorities for needed research on a nationwide scale complemented by institutional self-studies to guide future development of graduate institutions individually and collectively.

- Koenig, Herman E., et al.

  A Systems Model for Management, Planning, and Resource Allocation in Institutions of Higher Education

  Final Report National Science Foundation Project C-518. Division of Engineering Research, Michigan State University. East Lansing, Michigan. September 30, 1968.

  Conducted under NSF grants from 1964 to 1968, this report summarizes the research and development of a mathematical model of an educational institution that will provide the "logic" of information processing programs to aid university administrators in the overall allocation of resources which are described in terms of measurable quantities of personnel, space and equipment, and the associated budget required to obtain them at price levels imposed by economic conditions. In developing the "system" the university is viewed as a multivariable dynamic process with manpower and physical facilities as input and with developed manpower, community service and research as output. The model developed identifies a functional structure and an accounting system which delineates both the quantity and the unit costs of the inputs and outputs associated with each sector of the university. The report is organized into six major parts: application of system methods to a university viewed as a collection of interacting components and their constraints, the use of the model in administration, computer implementation of the model, documental description of data processing and simulation programs including a users' guide, a bibliography, and auxiliary reports.

● Lelong, Donald C., and William R. Mann

Systems Analysis for Institutional Output Decisions

Office of Institutional Research, University of Michigan. Ann Arbor, Michigan. April, 1968. (Mimeographed.)

This is a detailed treatise on the application of input-output analysis to university operations in general and the University of Michigan in particular, with emphasis upon study of long-term benefits attributable to a university in perspective of accompanying costs. There is increasing pressure from all sectors for accountability of expenditures for higher education; review indicates that cost-benefit analyses not only help explain university needs to the various publics, but they also serve as a valuable aid in making institutional output decisions. A logical sequence is: identification first of university objectives; identification and measurement of direct and indirect inputs to the system; analysis of the process of resource allocation and conflict resolution; identification and measurement of actual outputs consistent with university objectives; and identification, measurement, and analysis of pecuniary and nonpecuniary benefits derived from the university taking into account "value added" by the educational process. It is concluded from using University of Michigan data that no other alternative investment can match higher education, and when the benefits (direct and indirect) to society outweigh those to the individual, then government should have more of the burden, and the nation more than state and local sources.

● Miller, John Perry

Outputs of Higher Education: Graduate Education

The Outputs of Higher Education: Their Identification, Measurement and Evaluation. Ben Lawrence, et al., editors. Papers from a seminar held in cooperation with the American Council on Education and the Center for Research and Development in Higher Education at Berkeley. Western Interstate Commission for Higher Education. Boulder, Colorado. 105-109. July, 1970.

This paper given at the seminar held at Washington, D. C. specifically focuses on graduate education and concludes that institutions must define the function and process of graduate education to identify outputs, which Miller describes and discusses. Because objectives of the educational system are many, the outputs consequently are multiple and "joint products" in the economic sense; based on present knowledge it is questionable that meaningful measures can be developed for some of the important outputs--therefore judgment, faith, and intuition play an important part in most decisions, and these are important in decisions in which public benefits loom large. Since decisions are made at various levels, individual institutions must choose between alternative strategies and programs, and incremental decisions must be made periodically; changes in inputs affecting intermediate outputs must be evaluated. Outputs can be measured in terms of money, the "value added" concept. Nonmonetary measures can be assessed, and alumni employment experiences, publications, citations and other factors are indicative of benefits and outputs.

- National Science Foundation. Office of Economic and Manpower Studies

  Systems for Measuring and Reporting the Resources and Activities of Colleges and Universities

  NSF 67-15. U. S. Government Printing Office. Washington, D. C. 1967.

  This report, often referred to as the "Henle Report," was completed in 1965 from a study co-sponsored and co-financed by NIH and NSF beginning in 1959-60. The study was designed to devise and test systems of measuring and reporting activities in educational institutions, comprehensive enough to include all major activities and all fields, and which could be broadly compatible between institutions. Eight institutions, the sponsors and others cooperated in the study to develop the concept of a total information system that could be used as a base for further development and application. The report is organized into three major parts: Part I consists of nine chapters presenting the conceptional background examined or developed as basic guidelines for the study, assays results, presents overall recommendations, identifies major areas of data on personnel, students and facilities, and organizes and integrates these from three different points of view; the five chapters of Part II provide materials that supplement the concepts presented in Part I and outline an information system for university management with the major system of activities containing ten files and six categories; Part III contains reference materials.

- Riesman, David

  Alterations in Institutional Attitudes and Behavior

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 66-73. 1965.

  Riesman's essay stresses need for institutional research to find ways to cope with change. Faculties tend to join their own guilds, which make them less loyal to their institutions. Educational institutions need research and development review mechanisms as used by industry.

- Western Interstate Commission for Higher Education

  The Outputs of Higher Education: Their Identification, Measurement, and Evaluation

  Ben Lawrence, et al., editors. Papers from a seminar held in cooperation with the American Council on Education and the Center for Research and Development in Higher Education at Berkeley. Western Interstate Commission for Higher Education. Boulder, Colorado. July, 1970.

  Current urgency exhorts higher education to an examination of purposes, priorities, responsibilities, and capabilities; decision makers must seek honest, viable responses to public accountability, declining financial support, and an earlier overreaction to short-term needs. The first step toward meeting

these obligations is a purposeful allocation of resources after careful analysis of the activities, objectives and outputs of higher education.

Legal Challenges

- Holloway, John P.

  Legal Implications of Campus Unrest: A View from the Inside

  Report of a Legislative Work Conference on Higher Education. Western Interstate Commission for Higher Education. Boulder, Colorado. 19-23. February, 1970.

  In his address Holloway compares former university disciplinary actions with those of today. Historically the courts, applying the in loco parentis doctrine, did not interfere with university discipline. Higher education was a privilege, not a right; students had no constitutional protection and could be dismissed without hearing. Today formal proceedings make disciplinary action much more complicated. In loco parentis is no longer considered applicable, but the university following due process has the right to discipline students and prevent unlawful acts. Disciplinary actions used are probation, suspension, expulsion or prosecution under criminal trespass acts. Holloway discusses these procedures and court cases dealing with university affairs.

- Turner, James P.

  Legal Implications of Campus Unrest: A View from the Outside

  Report of a Legislative Work Conference on Higher Education. Western Interstate Commission for Higher Education. Boulder, Colorado. 15-18. February, 1970.

  In his address, Turner discusses the Federal viewpoint of legal involvement with discipline on the campus. The Department of Justice is not responsible for keeping order on the campus, only for enforcing Federal laws, although certain actions, such as inciting to riot, could warrant prosecution by the Department. Many bills have been introduced to involve the Federal government more directly in campus disorders: cutting off aid to students engaging in disruptive acts, prohibiting disruption of federally assisted institutions, and protecting the rights of the victims of civil disorders. With student unrest a frequent occurrence on college campuses, Turner feels that some opportunity to dissent meaningfully within the system must be provided, and the authority of college officials should be clarified.

Purpose and Nature

- Folger, John K.

  The Position of the Graduate School within the University

  Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 11-16. July, 1969.

  Folger lists the external influences affecting the role of the graduate school and the graduate dean in the university structure and projects changes in this role during the next decade due to three major influences: the perilous future of financial support compounded by rising costs and enrollments; the continued growth of the professional doctorate which the graduate dean can control by leadership in budget control; and student influence taking a more active role in institutional affairs, planning and policy making.

- Gross, Edward, and Paul V. Grambsch

  University Goals and Academic Power

  American Council on Education. Washington, D. C. 1968.

  The study indicates clearly that administrators and faculty tend to agree to a much greater extent than is commonly supposed; therefore, the greater power of administrators should not be regarded as necessarily inimical to the faculty or as inconsistent with the fundamental role and purposes of the university. It demonstrates, too, that clear differences among universities still exist, despite fears that our institutions of higher education are becoming more and more alike. Throughout the analyses of global characteristics and of power structure, clear distinctions emerge between elitist goals and "service" goals and between universities which emphasize intellect, scholarship, faculty interests, and prestige and those which emphasize nonintellective student development, direct service to the community, and the satisfaction of outside constituencies. Finally, the high degree of congruence that exists between perceived and preferred goals at particular institutions underscores the selective nature of our universities, their tendency to attract and keep faculty and administrators who are in basic sympathy with the goal emphases of the university.

- Henle, Robert J., S.J.

  The Place of the Graduate School in the Structure of the University

  Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 5-10. July, 1969.

  The role of the graduate school and dean in the university's structure is discussed and analyzed. Henle concluded that their primary function is to produce learned scholars--not researchers, and that the graduate dean should insure the student's program and experience are designed to give him the best educational result--not to promote a professor's research. Also, the dean--being the "watch dog" of program standards and of intellectual integrity across departmental lines and budgets--should be involved in hiring faculty, approving budgets, and other functions in order that he may be effective.

- Norris, Louis William

  Hidden Pervaders

  Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 7-18. December, 1963.

  The author, president of a small liberal arts college, criticizes graduate schools because they are not unified inclusive intellectual communities; subjects should not be self-terminating but should teach students to learn more. The graduate school should supply its students with a "historical perspective for their work, a sense of relevance in their learning to an intelligible and emerging future, and scholarship should have vitality, practicality, and unmistakable depth."

- Toynbee, Arnold J.

  Higher Education in a Time of Accelerating Change

  Paper No. 3. Academy for Educational Development. New York. 1968.

  This publication is an essay by Toynbee which appears now as the preface to the publication Campus, 1980. It contains a discussion of six major headings and gives new slants to old subjects. The main topics are: reasons for the present need for reconsidering and recasting higher education, a review or history of the original purposes of universities in the world's three living societies, and discussions of the static nature of these societies, their cultures and the philosophy underlying them. Toynbee gives an outline of the major factors leading up to and causing a revolt against the static, traditional concepts of life and education, and a change to more dynamic education beginning in the 17th century through the 20th century. He discusses the consequences of dynamism for education: more education for more people, the tendency

toward specialization, and an acceleration of the pace resulting in rapid advances and changes. He outlines the possible changes in higher education needed to solve the problems created. Toynbee concludes: education should be life-long, self-continuing education, and it should be started early to give to the student the desire for intellectual independence and the initiative for self-education.

- Whaley, W. Gordon

The Empty Chalice

The Graduate Journal, Volume VII, No. 2, 336-345, Spring, 1967.

As one of the five papers given at the retirement of Dean Ralph Sawyer at Michigan, Whaley's discussion reviews the history, purposes and characteristics of the United States graduate school. He laments the imbalance between science and the humanities and the goal of professionalism as causes of some of our ills, concludes that the basic function of the graduate school is to "fire up" a disciplined intellectual passion once found, and he calls for innovation and imagination in the process.

I N S T R U C T I O N A N D R E S E A R C H

ADMISSIONS: CRITERIA, STANDARDS, PROBLEMS

● Graham, Jane, editor

Graduate Study and the Undergraduate

A Guide to Graduate Study: Programs Leading to the Ph.D. Degree. Third Edition. American Council on Education. Washington, D. C. 3-51. 1965.

This is a handbook written for the use of the prospective graduate student focusing on the Ph.D. in arts and sciences. The objectives of graduate study are outlined with the emphasis on college teaching and research. The characteristics sought by graduate schools, how to prepare for and select a graduate school, gain admission to and finance graduate study, are described and discussed. It concludes with a section on what to expect in graduate school and how the standards and hurdles can be met and solved.

● Harvey, Philip R., and Gary L. Marco

Aptitude and Advanced Test Scores of 1963-64 National Program Candidates by Undergraduate Major Field

Graduate Record Examinations Special Report No. 65-3. Educational Testing Service. Princeton, New Jersey. August, 1965.

The report presents data for the 1963-64 academic year in the GRE National Program for Graduate School Selection, in which the Aptitude Test and 17 Advanced Tests were administered to a total of 83,671 candidates, primarily college seniors. The authors conclude that those taking the examinations in the National Program represent a more select group than those students applying for admission to graduate school generally; although persons with high GRE scores generally achieve better than individuals with low scores, the efficiency of the GRE Tests in predicting achievement cannot be determined until validity studies in a particular major field at a particular university or college are conducted.

● Koen, Frank M.

What Are Your Objectives? Some Implications for Admitting Graduate Students, Training College Teachers and Evaluating Teaching

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 31-36. July, 1969.

The author states that the selection system or admissions criteria used by graduate schools are not doing a good job as evidenced by the attrition rate. Koen believes that selection needs more than a look at past performance, because it is not course work that stops a graduate student. A creativity test developed by Stephen Klein for the ETS (GREB) as a means of measuring what makes a successful student is discussed. The graduate dean would be overall coordinator for such tests. Koen also recommends an absolute need for teacher training in Ph.D. programs and an evaluation of teaching.

● Lannholm, Gerald V.

The Use of GRE Scores and Other Factors in Graduate School Admissions

Graduate Record Examinations Special Report No. 68-4. Educational Testing Service. Princeton, New Jersey. October, 1968.

Questionnaires, soliciting information about the use of Graduate Record Examinations scores and other factors for admission to graduate study, were sent to selected departments in 30 institutions. Results showed undergraduate records, test scores and letters of recommendation to be the elements most commonly considered: about 40% of the institutions set minimum GRE scores for admission, with the requirement varying substantially among and within universities. Most, but not all, departments assign the highest rank in importance to the undergraduate record. GRE scores are ranked either first or second in importance by 53% of the departments; if any of the elements are weighted, the undergraduate record and the GRE scores receive the most weight. An applicant with good GRE scores and a bad undergraduate record or recommendations probably will not be admitted; in order to obtain financial assistance, higher GRE scores are usually required. Foreign students are usually required to take the Aptitude Test, with stress on the Verbal score for admission.

● Williams, John D., et al.

Judgment Analysis for Assessing Doctoral Admission Policies

The Journal of Experimental Education, Volume XXXVIII, No. 2, 92-96, Winter, 1969.

The study concerns the evaluation of a doctoral admission policy of a single university department. A Q-sort technique was used by 12 graduate faculty members in rating 33 doctoral graduates. Multiple linear regression and the Judgment Analysis technique separated the raters into two judgment systems: one group placed more emphasis upon the Miller Analogies Test and the other tended to emphasize all the test scores and the undergraduate GPA.

DEGREES: REQUIREMENTS AND PROBLEMS

● Allen, Don Cameron

Can the Ph.D. Be Streamlined?

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 53-57. December, 1967.

Allen reviews the history and problems associated with the Ph.D. in English and humanities and suggests ways to streamline the program to allow students to graduate in three to four years: reduce the requirements, which have accumulated, so that they become realistic; arrange for more full-time study by providing better support for graduate students; and decrease unreasonable hurdles such as language requirements, stress upon encyclopedic knowledge, and a too-long dissertation.

● American Association of State Colleges and Universities and the National Conference on the Intermediate Degree

The Specialist Degree

American Association of State Colleges and Universities. Washington, D. C.

This booklet is a report on the Specialist Degree; it gives the background on the Specialist Degree, provides information concerning standards, faculty, financial resources, and steps to follow in establishing the degree program. This degree, requiring two years beyond the B.A., is intended to aid in preparing for positions requiring a higher level of study than the master's but does not place the emphasis on research required for the Ph.D.; it requires special courses and needs greater library facilities than are available to master's candidates. Six steps to be followed in establishing the degree program are outlined.

- The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States

  The Doctor of Philosophy Degree

  The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States. Washington, D. C. December, 1964.

  This is a joint statement by CGS and AGS setting forth the main desirable characteristics of programs of good quality leading to the Ph.D. The pertinent and essential attributes of the academic climate, specialization of courses, graduate faculty, student's program and progress, physical facilities and the library, and the organization of the graduate school are delineated and defined.

- The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States

  The Doctor's Degree in Professional Fields

  The Association of Graduate Schools in the Association of American Universities and the Council of Graduate Schools in the United States. Washington, D. C. 1966.

  This statement issued jointly by CGS and AGS describes the doctor's degrees awarded for completion of academic preparation for practice and other professional activities. It stresses that these degrees should maintain the same high standard established in preparation for the Ph.D. or M.D. Other characteristics and desirable attributes are listed and discussed.

- Berelson, Bernard

  Graduate Education in the United States

  McGraw-Hill Book Company. New York. 1960.

  Berelson's study of graduate education, published in 1960, covers the history and analyzes the present and future trends. He recommends tightening doctoral work to a norm of four years by shortening the dissertation, changing language requirements and oral examinations. He believes student support should be regularized, with the student paying more of his own way, but also that industry provide more support to graduate education. Better recruiting of graduate students is urged but he does not feel that there will be a critical shortage of college teachers by 1970. He supports new ideas in regard to teacher training and suggests a possible new intermediate degree. Quality in graduate education must be maintained and is in danger with the increasing number of institutions embarking upon it. Major responsibility for graduate study should stay in the presently established institutions of top or middle prestige. The role of the graduate dean should be strengthened and he suggests that graduate faculties should institute review of graduate programs both by discipline and by institution.

● Bowers, Fredson

On a Future for Graduate Studies

AAUP Bulletin, Volume LVI, No. 4, 366-370, December, 1970.

This article centers around criticism of the Ph.D.: that it is unsuitable for those engaged in collegiate education, that intellectually dissatisfied graduate students are rejecting the basic assumptions upon which the degree rests, and that it is unlikely that it can be reformed. Bowers suggests that the Ph.D. be restored to its former tough rigor; that the D.A. and D.Sc. be divorced from the research orientation of the Ph.D. and be substituted for the masses seeking the doctorate for teaching or practice.

● Carmichael, Oliver Cromwell

Graduate Education: A Critique and a Program

Harper & Brothers, Publishers. New York. 1961.

Carmichael offers many criticisms of graduate education and some recommendations for its improvement. In 1961 there was a great shortage of college teachers; therefore, many of the recommendations deal with remedies to relieve the shortage. He suggests a strengthened Master of Philosophy degree for college teachers with an option to continue on to a teaching-oriented doctorate. He blames the graduate school for the poor recruitment of students and for the unnecessary length of time it takes for them to get the Ph.D.; undergraduate institutions are castigated for their lack of properly preparing students for graduate study. The goals and purpose of graduate education have not been clearly defined and the students suffer because of this lack. He suggests that the graduate dean and a staff responsible to him should revise the doctoral program so that the able student can plan his program with certainty of completing it on schedule.

● Carmichael, Oliver Cromwell

A Three-Year Master's Degree Beginning with the Junior Year in College

The Journal of Higher Education, Volume XXXI, 127-132, March, 1960.

Carmichael's proposal for a new three-year master's degree, where a qualified student is permitted to enroll as a three-year M.A. candidate as a junior, was made during a period when the shortage of qualified college teachers, especially Ph.D.'s, was acute in every field. In essence it combines the B.A. and M.A. programs early enough to identify the gifted student interested in teaching by providing a more challenging program.

- Carnegie Quarterly

  The Doctor of Arts: A High Degree of Teaching Competence

  Carnegie Quarterly, Volume XVIII, Numbers 1 & 2, 1-3, Winter/Spring, 1970.

  This is a review of the current status of the Doctor of Arts, giving its historical background and development, and assessing advantages and disadvantages for its future potential and acceptance. It emphasizes that the D.A. is gaining in popularity and proponents (endorsement by NSF, National Academy of Arts and Sciences, AASCU, CGS, and other groups), mainly because changed conditions in our graduate schools and society in recent years have brought about changed attitudes creating a more favorable climate for the D.A. The Carnegie-Mellon D.A. program is cited and discussed as the prototype. According to the article the early 1970's will be the proving ground for firm acceptance and future success of the D.A. degree.

- Coordinating Council for Higher Education

  Approaches to Preparing Prospective College Teachers

  A Staff Report to the California Coordinating Council for Higher Education. Sacramento. December, 1968. (Mimeographed.)

  The report addresses itself to increasing interest and aptitude in college teaching and consists of two parts reflecting two general approaches: doctoral programs with emphasis upon preparing graduate students for college teaching, and the Doctorate of Arts degree. The first part gives a survey of the literature and practices used, with findings and conclusions summarized. With regard to the D.A., it is concluded that this degree program should not be initiated in the California public institutions at this time. Limitations, advantages, and potential need and success for the D.A. are given and discussed.

- Cordozier, V. R.

  The Doctor of Arts Degree

  The Journal of Higher Education, Volume XXXIX, 261-270, May, 1968.

  The main thesis of this paper is an argument for the Doctor of Arts degree as preparation for college teaching, particularly for undergraduates. The author believes that the D.A. would reduce the Ph.D. stretch-out and the ABD's. The success of the D.A. depends upon its ability to attract able students who prefer broad coursework preparation in preference to the research orientation of the current Ph.D. programs.

- Council of Graduate Schools in the United States

  The Doctor of Arts Degree

  Council of Graduate Schools in the United States. Washington, D. C. March, 1970.

  This statement, prepared by the Council of Graduate Schools, summarizes the needs and objectives and establishes the proposed structure and guidelines for the Doctor of Arts degree. Briefly, it should be a three-year (no more than four-year) program oriented toward developing teaching competence in a broad subject matter area, and be comparable in quality, standards, and rigor to the Ph.D. The teaching internship and the lack of the in-depth research experience of the Ph.D. are the major differences of the D.A. from the traditional Ph.D.

- Council of Graduate Schools in the United States

  The Master's Degree

  Council of Graduate Schools in the United States. Washington, D. C. March, 1966.

  This brochure gives guidelines, characteristics, and standards for initiating and maintaining quality programs leading to the master's degree: quality is vital in starting and maintaining programs; programs should be organized under a graduate school and supervised by a graduate dean; the M.A. or the M.S., without designation, should be adopted for scholarly research and teaching-oriented programs; the professional master's degrees, such as the M.B.A., M.Ed., M.F.A., etc., should be for professionally-oriented programs restricted in number and names. Other desired characteristics of the two general types of master's degrees programs are described in detail.

- Council of Graduate Schools in the United States

  Proceedings of the Wingspread Conference on the Doctor of Arts Degree

  Arthur M. Eastman, editor. Council of Graduate Schools in the United States. Racine, Wisconsin. October, 1970.

  This publication summarizes the invitational national Conference on the Doctor of Arts Degree, sponsored by CGS in cooperation with the Carnegie Corporation and the Johnson Foundation, held from October 25-27, 1970. Conferees represented "producers," "consumers," and "experts" representing other interests. The conference, like the degree itself, came into being because of changing needs in graduate education and growing disenchantment with doctoral training by students, employers, and the graduate schools. The purpose of the conference was not to debate whether the D.A. should come into being (for it already exists with the awarding of the first degree by Carnegie-Mellon in June 1968), but to determine how D.A. programs could be put together

and how to maintain their quality. Five plenary sessions, starting with the keynote address by Steinberg, focus on the D.A. in the marketplace, program content, standards and quality, and institutional and organizational considerations. Discussions of the topics ranged widely, and the mood, although generally affirmative, was tentative--if the CGS booklet is the D.A.'s Declaration of Independence, its Constitution is yet to be written. Eastman summarizes the general sense of the conference as follows: educationally we are a multitudinous and heterogeneous society; at present the community colleges are more to be served with good master's programs than with doctorates; and the D.A. offers the opportunity to break the lockstep of the traditional Ph.D.--its rewards that presently dominate graduate and undergraduate education, the training of quality college teachers, and the rationale for determining educational priorities.

● Elberg, Sanford S.

General Features of Graduate Degree Programs

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 57-68. July, 1969.

As a background to the topic, the author discusses graduate degree programs at Berkeley from entrance through the thesis. The many common problems of the graduate schools, needed changes, and the role of the graduate dean in instigating innovation and reform are cited and discussed.

● Folger, John K.

One Ph.D. or Two?

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 45-53. December, 1967.

This report centers on a Ph.D. degree for college teaching as an end in itself. Folger suggests that teaching internships and proper supervision could help develop competency. However, he doubts this will solve the problem or that a teaching doctorate will become important in the next decade.

● Kirk, Grayson Louis

It Takes a Person Too Long to Get an Advanced Degree

Nation's Schools, Volume LXIV, 50, July, 1959.

Because many undergraduates are now better prepared, the thesis is advanced that graduate schools should raise their admission standards, teach only

the essentials and stress the ability to think creatively--thus shortening the doctoral process and making it an exciting experience rather than a test of financial and physical endurance.

- McCarthy, Joseph L.

  The Graduate School

  The Journal of Higher Education, Volume XLI, No. 5, 403-406, May, 1970.

  McCarthy sees the advent of the D.A. degree for college teaching. The Council of Graduate Schools and the American Association of State Colleges and Universities proposals for the D.A. include: level comparable with other higher degrees, broad knowledge and background of the field and related areas, emphasis on understanding and interpreting research results, knowledge of philosophy of education and psychology of learning, dissertation contributing to teaching improvement, and a year internship in college teaching. McCarthy suggests the D.A. will be accepted because society needs broadly trained teachers.

- McCarthy, Joseph L.

  Graduate Study in Practitioner-Oriented Fields

  Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 115-121. July, 1969.

  The author distinguishes between practitioner and research-oriented programs using the Ph.D. and M.D. for the contrast. He feels that the practice-oriented programs are needed in many fields leading to different degrees. A good description is given of a practice-oriented program for college teachers (D.A.) suggesting broad field understanding, capacity for new research, knowledge of history and psychology of teaching, modest dissertations and internship under an experienced teacher. McCarthy believes these fields will expand and that help in financing will be essential.

- McGrath, Earl James

  The Graduate School and the Decline of Liberal Education

  Bureau of Publications, Teachers College, Columbia University. New York. 1959.

  McGrath bewails that the liberal arts institutions, once occupying the center of the stage of academe in the United States, have now languished in part, if not entirely, to the influence of the modern graduate school. He suggests that if the liberal arts schools are to regain their former role and proper functions they must free themselves from the dominance of the graduate

schools. In developing his theme, McGrath reviews the history and purpose of liberal education and how the dominance of graduate research became the primary model and teachers and professors became secondary. He recommends drastic reforms in graduate education to permit a much needed reorientation of liberal education (now largely embodied in the Doctor of Arts degree) and a two-track doctoral program--one for research careers and one for college teaching. Some of his predictions have subsequently been realized.

● McMurrin, Sterling M.

The University-Wide Foreign Language Requirement

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 74-76. December, 1967.

The author reviews and evaluates two reference sources on the subject--the monograph by Lund and Herslow and the article by Admussen. He advocates modification of the traditional French-German requirements because of the growing importance of other languages such as Russian and Japanese, the rising status of English in technical usage, and because language competence should be a requirement for entrance to, rather than exiting from, graduate school. He recommends individualizing the requirements to match the student's subject and research activity.

● Muelder, Milton E.

General Features of Graduate Degree Programs

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 69-84. July, 1969.

Great diversity exists in graduate program requirements across the nation in terms of: number of credits needed, language skills, continuous registration, time limits for the completion of degrees, examinations and other facets. Most of the problems and needed solutions are commonly shared.

● Nichols, Roy F.

A Reconsideration of the Ph.D.

The Graduate Journal, Volume VII, No. 2, 325-335, Spring, 1967.

Nichols' paper, given in 1967, presents his thesis that a double standard and dual purposes exist in graduate schools. A basic flaw results from the base upon which our graduate system was erected and the dogma that all students pursuing a Ph.D. must pass through the same system whether they elect a teaching or a research career. In 1967, a shortage was predicted in the supply of Ph.D.'s

needed to meet demands of society, and the "numbers game" was causing difficulty. Graduate schools should admit they give two types of Ph.D.'s (scholarly versus teaching) and adjust curricula accordingly. He proposes a "pass" major--a four-year program comprising broad interpretative courses, one-year of supervised teaching, and a seminar for preparation of a publishable journal article; an "honors" Ph.D. would be offered for only those selected by the research faculty to go on for a research degree. Support for both types would be determined by individual needs and quality of effort for three to four years.

● Panel Discussion: Huganir, George H., chairman; Robert P. Browder, Joseph A. Devenny, Robert Koenker, panel members

The Functions and Future of the Master's Degree

Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 111-121. December, 1963.

This is a panel review and far-ranging discussion of the master's degree: its historical development and evolution, studies conducted since the turn of the century, standards, quality, and requirements--all are traced by the discussants--and recommendations mostly revolving around standards for the degree are made.

● Rees, Mina

Perspective

Proceedings Twelfth Annual Meeting. Western Association of Graduate Schools. Seattle. 12-21. March, 1970.

Rees contends that graduate schools must change with the times in order to provide students with a more broadly based education which will prepare them to cope with multi- and interdisciplinary problems of society. Practitioners to handle problem-oriented research must be produced and trained as the M.D. is trained; the D.A. is suggested for college teachers, and other degrees are felt to be needed for areas such as business and industry. The Ph.D. and master's will still have a place in graduate schools. She also reviews and evaluates several recent reports suggesting reform in graduate programs to accommodate needed changes.

● Scully, Malcolm G.

Language-Study Requirements Are Challenged

The Chronicle of Higher Education, Volume V, No. 8, 1, 6, November 16, 1970.

Author reviews the declining interest on the part of college students in languages and the demands of many to end the requirements for them. Language

3 OF 4
ED
058 830

departments, having enjoyed a "protective tariff" in the academic community, will have to revise their methods of teaching languages so as to appeal to students and to end the "high school manner" of teaching them. Teaching languages as part of area studies programs is suggested as one method of appealing to student's interest.

● Spurr, Stephen H.

Academic Degree Structures: Innovative Approaches--Principles of Reform in Degree Structures in the United States

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1970.

Fourteen chapters, with bibliographies, are devoted to the general theme of the title. The first two chapters give background materials on the origins of academic certification, degree structures, and the development and nomenclature (with basic terms defined) of academic degrees. The derivation of accepted degrees abroad and the development of American degree usage are described in terms of historical evolution. In Chapter 14, Spurr proposes a generalized system of higher education in the United States to create a fluid and interconnecting pattern permitting the movement of the student within the system and the development of his maximum potential. Six levels of degrees starting with the Associate and proceeding through the Bachelor, Master, Intermediate Graduate, the Doctor and the Postdoctoral are proposed. Several (four) possible patterns for graduate degrees are described and discussed.

● Spurr, Stephen H., and D. C. Spriesterbach

The Intermediate Degree: The Case for It, The Case against It

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 57-73. December, 1967.

The positive and negative features of the intermediate degree are presented by Spurr and Spriesterbach. Spurr discusses the case for the intermediate liberal arts degree, which would be a distinct degree parallel to and strengthening the intermediate professional degree; it would be given two or three years after the baccalaureate and could be either the British M.Phil. degree or the Candidate in Philosophy degree. Above all it should mark postive accomplishment, not failure. It could be used as a terminal degree or a degree or certificate en route to a higher degree. There are three alternative approaches: upgrade the master's, establish a new doctorate lower than the Ph.D., or establish the new degree with hope it will gain currency similar to the master's or doctorate. The effect on the Ph.D. will be to tighten some of the requirements for it and to distract some students from the Ph.D. as the end goal. There should be several uses for holders of this degree, such as, utilization by the growing number of junior and community colleges, and the filling of some uni-

versity positions. Spriesterbach feels that the present system is adequate, that the impact of an intermediate degree on the Ph.D. will be very great, and that a major bottleneck in the production system is the ABD problem. He alleges that changing the symbol does not change the reality, that proposing other and more degrees does not meet the need or prepare teachers better, and to do so will only confuse the producer and the consumer. These degree holders will be second class citizens and there will be a prejudice against them by department heads; few doctorates are awarded at the University of Iowa without teaching experience and the attempts to distinguish between research and teaching functions are being strongly resisted.

● Walters, Everett, editor

Graduate Education Today

American Council on Education. Washington, D. C. 1965.

This series of thirteen essays, edited by Walters, by present or former graduate deans reportedly is designed for those concerned with the problems of graduate education, to present an authoritative up-to-date account, and to meet some of the criticisms about graduate education. Walters' introduction sets the stage for the essays by tracing the history and rise of graduate education in the United States, degrees offered and their evolution, and various factors influencing and controlling the shape and organization of the development of graduate schools and their programs. Of special significance are the discussions by: Prior on the Ph.D. degree, its criticisms (most of them valid), preservation and improvement; Ashton on other doctorates, their strengths and weaknesses, with the proposal that three doctorates be established; Snell on master's degree programs, historically and from the vantage point of a survey, with conclusions summarized as "14 points"; and Bent on graduate student support, types and criticisms, and the suggested advantage of one national program handled by a single agency. Most of the germane essays are abstracted separately.

● Weisinger, Herbert

Psyche's Seeds

Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 13-22. December, 1969.

In this paper, Weisinger looks at problems facing graduate education. The growth of two- and four-year colleges has created a great need for teachers who are well versed in their fields and are not necessarily researchers. To fill this need, graduate schools and universities might revise their doctoral programs to include two years of successful teaching as an alternative to the research thesis. Although the role of universities in researching social and technical problems has been questioned, research of this nature can be conducted as long as it does not imperil the university as a center for learning.

Weisinger suggests inter- or multidisciplinary approaches to research as an improvement, and also that the university--as a part of society--can best discharge its responsibility to enlarge the humanity of man by retaining its freedom to subject ideas and actions to a critical, scholarly and dispassionate scrutiny.

● Western Interstate Commission for Higher Education

Higher Ed Administrators Probe Credit by Exam, External Degree

Reports on Higher Education, Volume XVII, No. 3, 1, 2, 6, April, 1971.

WICHE and CEEB held workshops in Salt Lake City and Los Angeles in February 1970 to explore the implications for credit-by-examination. Simply, credit-by-examination, or the external degree, embodies granting academic credit for knowledge gained outside the formal classroom on the basis of passing an approved examination. Educators in attendance differed in their reaction to the idea; to some it represents a new world of educational progress, to others the concept seems well intentioned but not without faults or future problems. Representative of the latter view was the attitude expressed by Hanford of the CEEB--although supporting both credit-by-exam and the external degree, he urged caution and continuing attention to academic standards for fear "there is a danger of a pollution of the education process." The seven speakers were generally supportive of the concept but several pointed out the potential problems and pitfalls in making the external degree educationally acceptable and successful.

PROGRAMS: FIELD, INTERDISCIPLINARY, COOPERATIVE, SPECIAL, TEACHING, POSTDOCTORAL

● Allen, Don Cameron

The Ph.D. in English and American Literature

Holt, Rinehart, and Winston, Inc. New York. 1968.

Allen stresses the importance of recruitment, preparation and guidance of able students to do Ph.D. work in the field and suggests ways to eliminate unnecessary delay and impediments in Ph.D. programs. Recommendations are made that the Ph.D. in English be regarded as a four-year (in course) degree and that provisions for postdoctoral work of the highest standard for the highly talented and potential leaders of the profession be offered. In view of the latter recommendation, Allen concludes that very few universities can justifiably do postdoctoral work.

- American Council of Learned Societies Devoted to Humanities

  The Social Studies and the Social Sciences

  Harcourt, Brace, and World, Inc. New York. 1962.

  This publication contains a number of essays that center on the common theme that the social sciences curriculum badly needs revision; although each author proposes general guidelines for reform in his respective field, the general consensus is that until some agreement is achieved and common objectives defined as to the aims of the disciplines comprising the social sciences, curriculum revision will accomplish little. It is proposed that a commission comprised of researchers, teachers and leaders in the social sciences be established to study problems, to single out critical areas needing immediate attention, and to establish nationwide uniformity in curriculum that has meaning in depth and breadth.

- American Institute of Physics

  Graduate Programs in Physics and Astronomy: A Handbook for Advisors of Prospective Doctoral and Master's Students

  AIP Publication R-205. American Institute of Physics. New York. 1968.

  This handbook inventories the salient features, statistics, and requirements and provides other information on the Ph.D. and master's programs of all United States schools offering these programs in physics and astronomy over the period 1962-1967.

- Arlt, Gustave O.

  The Renascence of the Humanities

  The Graduate Journal, Volume VII, No. 2, 301-309, Spring, 1967.

  This is one of five papers given at the retirement of Ralph A. Sawyer from the University of Michigan. Arlt describes the rebirth of the humanities after their erosion beginning about 100 years ago with the dominance of the natural sciences and their great impact upon the educational system. The acceptance of interdisciplinary study and degrees in the humane fields, and the establishment of the National Foundation on the Arts and the Humanities have given the greatest boost to the rejuvenation of the humanities, according to Arlt. Other characteristics and current trends of the humanities, boding for an optimistic future, are portrayed.

● Bush, Douglas

The Humanities

The Contemporary University: U.S.A. R. S Morison, editor. Houghton Mifflin Company. Boston. 186-205. 1966.

Humanities are by their nature the chief agents of the civilizing process; argument for a balance between the humanities and science is presented.

● Butterfield, Victor L.

What Standard of Scholarship Does the Undergraduate Teacher and Scholar Need?

Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 22-28. December, 1963.

The paper deplores the approach of applying the scientific method to all things which really are not scientific at all--the classics, the humanities and even some of the social sciences. Because of this fact, there is an unwillingness to tackle important problems since they are not susceptible to scientific or psuedoscientific attack. The author makes a plea for a philosophy of "organic vitalism."

● Carnegie Quarterly

Are Graduate Schools Slighting a Major Function?

Carnegie Quarterly, Volume VIII, No. 1, 1-3, January, 1960.

This article is a critique and summary of McGrath's The Graduate School and the Decline of Liberal Education, a 65-page essay. In summary, a cure for the alleged illness in graduate Ph.D. programs is to make the programs for those intending to be college teachers different from those of future research scholars, and hence to improve undergraduate education in the process. In retrospect, McGrath's recommendations for a college teaching degree and his suggested components of it are not unlike the D.A. now coming into prominence and possible fruition.

● Cronon, E. David

Doctoral Programs in History: A Report

AHA Newsletter, Volume VII, 6-11, June, 1969.

This report summarizes the study of the American Historical Association's Committee on Ph.D. Programs in History conducted in 1967. Information from 113 departments of history was analyzed and a code of desirable standards was

drafted; 65 of the departments met the standards, 48 did not. Factors such as course content, language requirements, size of professional staff, graduate degrees awarded and support of doctoral students are considered.

- Dennis, Lawrence E., and Renate M. Jacob, editors

  The Arts in Higher Education

  Jossey-Bass, Inc., Publishers. San Francisco. 1968.

  This report summarizes the first phase of a study concerning the access and barriers to the arts in higher education. The publication consists of the seven original essays and concludes with five strong recommendations for needed action directed at a long-term, intensive, coordinated effort designed to give the arts the stimulus similar to that given the sciences in the 1950's and 1960's. These are: establishment of a National Commission on the Arts in Education; establishment of continuing regional seminars; establishment of regional creativity test centers; development of new courses, curricula, and instructional materials at both secondary and college levels; and research on public attitudes toward the arts. Financial funding sources for the implementation of the recommendations are outlined.

- ETS Developments

  Commission on Non-Traditional Study Develops Action Program

  ETS Developments, Volume XVIII, No. 3, 1, Spring, 1971.

  A Commission on Non-Traditional Study, supported by a two-year grant from the Carnegie Corporation of New York, has been established in the public interest by ETS and the College Board; Samuel B. Gould is serving as chairman. An initial meeting was held in March of 1971 to determine objectives and to map a program of action. The Commission's overall concern is with increasing both access to and recognition of post-secondary learning by whatever means such learning is--or could be--achieved; they will work with all other groups and agencies interested in constructive educational change. Plans of the Commission are to determine the common threads among existing plans for off-campus study, credit by examination, and external degrees; also, they plan to devise a coherent philosophy that will bring some unity to the many efforts now underway. Several subcommittees will consider specific aspects of nontraditional study and the external degree concept: one will concentrate on the whole area of access; another will study the means by which individuals can learn; one will focus on questions relating to recognition of learning achievements; and another will study the financial aspect of nontraditional study.

● Egerton, John

High Risk: Five Looks

Southern Education Report, Volume III, No. 8, 25-36, April, 1968.

This article reviews programs for disadvantaged (high risk) students in five institutions that are adjusting to meet the needs of such students. Experience shows that the performance of high risk students is often comparable to that of their normal classmates. Wisconsin's program for the disadvantaged, begun in 1966, admits about 60 students each year and revolves around a well-organized and highly flexible system of tutors and tutor-supervisors. Wesleyan University decided to incorporate racial and economic diversity into its student body in 1964, but more than 1/2 of the first group admitted were not actually "high risks." Their program included: careful choice of faculty, advisors, tutoring, reduced course loads, and aspects of the Upward Bound and Master of Arts in Teaching programs. Southern Illinois University's Experiment in Higher Education had as its objective the development of necessary skills for completing college in the low-income, underachieving youngsters. Their curriculum, built around social sciences, humanities and the natural sciences, relies heavily on special instruction in reading, writing, and speaking. Because of its success, continued funding is assured. Antioch College is unique with its Program for Interracial Education wherein students are required to alternate on-campus study with off-campus employment; a normal degree program takes five years and students are deeply involved in student government. Berkeley and UCLA are actively recruiting low-income and minority students and assisting their admission, financing, and success in the Educational Opportunity Program. The success rate of these students is greater than the average freshman class.

● Elder, J. Petersen

Graduate Studies in the Humanities and Arts

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 109-113. July, 1969.

New programs in the humanities must have scholarly rigor concentrating on history's critical perspectives; training in the humanities should create a critical judge sensitive to injustice. Undergraduate Afro-American studies must precede graduate programs. A five-year limit on the Ph.D. program is necessary with teaching experience vital. Humanities should expand credit in courses outside the field. The mal-distribution of financial aid should be investigated by faculty committees.

● Furniss, W. Todd

Racial Minorities and Curriculum Change

The Educational Record, Volume L, No. 4, 360-370, Fall, 1969.

The author examines the assumption that colleges possess the ability to solve the social and personal problems inherent in the racial issues and suggests several areas where initiative and accommodations may be productive. Recommendations and demands have been motivated by five factors or considerations: correcting American history by a more adequate recognition of the experiences and roles of 25 million black citizens, hastening integration by improving the understanding of blacks by nonblacks, hastening integration by preparing black students to participate in society with pride and self-confidence, preparing the black student to understand and work for a black community, and providing black students with a sense of "power." The problems discussed are applicable to all disadvantaged groups, although black studies for the largest minority group are highlighted. Demands for black studies have coincided with questioning of the legitimacy of institutional authority; in responding to these demands, an institution must listen and act to incorporate ethnic and black studies programs which aim to equalize freedom of choice for all parts of society.

● Green, A. E. S.

PRAI for the American Campus: The Postdoctoral Research Associate-Instructor

University of Florida. Gainesville, Florida. 1968. (Mimeographed.)

This unpublished paper questions the usefulness and the economic return of the traditional postdoctoral appointment. A combination research associate-instructorship is proposed in lieu of this and is discussed in terms of cost and productivity; the general conclusion is that the PRAI would improve both the research and teaching experience of the new Ph.D.

● Handler, Philip, editor

Biology and the Future of Man

Oxford University Press. New York. 1970.

Under the chairmanship of Handler and the sponsorship of NAS, a study by 21 scientific panels of distinguished scientists was launched in 1966. The topics assigned are indicated by the chapter titles of the book; reports were assembled by the panels, severely criticized by the Survey Committee, finally revised and edited by the chairman, and published in 1970. Chapters 1 through 13 dealt with living phenomena at increasing higher levels of organization (from molecular to ecosystems). Chapter 14 was devoted to the digital computer as applied to the life sciences, and Chapters 15 through 19 provided a series of illustrations of the manner in which the understanding

of biology has been put to work in the service of man. An essay, wherein challenges involving man and his problems for today and tommorrow, comprised the final chapter.

- Jewett, John, et al.

Aspects of Graduate Training in the Mathematical Sciences

Conference Board of the Mathematical Sciences. Volume II. Washington, D. C. 1969.

Presented in six chapters by the Conference Board of the Mathematical Sciences, this factual, far-ranging treatise discusses the present state of the mathematical sciences; only the most direct inferences are made from the information obtained from data collected from various sources. Historical background information is reviewed, followed by chapters concerning: graduate faculty, graduate students, process of graduate education and programs, thesis supervision as related to Ph.D. production, and postdoctoral employment and research. It represents an excellent reference source giving detailed insight to the entire subject of graduate education in mathematics.

- Kruskal, William, editor

Mathematical Sciences and Social Sciences

The Behavioral and Social Sciences Survey Series. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 1970.

This book, one of a series by the Behavioral and Social Sciences Survey conducted through the Committee on Science and Public Policy of the National Academy of Sciences and the Problems and Policy Committee of the Social Science Research Council, has as its main theme the relevance and importance of the mathematical sciences to the social sciences. It recommends the following to facilitate cooperation between these fields: increasing the number and effectiveness of social statisticians; recognizing and correcting statistical error in areas of public policy; recruiting able data collectors; improving the use and reducing the cost of the computer in social science areas; building graduate schools of applied behavioral sciences to bring together many disciplines in cooperative research; teaching mathematics to social science students utilizing cooperative arrangements between mathematics and social sciences departments possibly by forming a mathematical science department within a social science school; using programmed learning; training in data collection and verification in academic programs; and using real data on real problems in training.

● Landgraf, John L.

Graduate Study in the Social Sciences

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 103-107. July, 1969.

Future changes in the social sciences are predicted; rapid growth and importance of anthropology, political science, sociology, and psychology are particularly forecast. A critique of needs and analysis of specific fields are given. Social problems are dictating the need for answers and better students will enter the social and behavioral sciences to meet the challenges.

● Lowry, W. McNeil

The Arts

The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 206-216. 1966.

The author reviews the tendency to judge the arts in quantitative and physical terms, the assumption of the responsibility for professional training in the arts by the university, and discusses the role of the creative and performing arts in higher education in general.

● McCain, James A.

Cooperation among American Universities in Technical Assistance Programs

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 204-206. 1965.

Two AID-university foreign projects in which several United States institutions cooperated very successfully in programs in India and Egypt, one in agricultural education and the other in engineering education, are described.

● National Academy of Sciences. National Research Council. Committee for the Survey of Chemistry. F. H. Westheimer, chairman

Chemistry: Opportunities and Needs

A Report on Basic Research in U. S. Chemistry. Publication 1292. National Academy of Sciences. Washington, D. C. 1965.

Known as the Westheimer Report, this study surveys chemistry research in the United States, notes the explosive growth of electronic instrumentation opening up new vistas for research, and reviews the growth and sources of fi-

nancing for research and graduate training in the universities. Based on the study, a series of actions designed to maintain and to increase the vigor of American chemistry are recommended, including the estimated funding required: an average of 25% annual rate increase from 1964 to 1968 for support of basic research, a substantial sum for major instruments, $5 million a year to support young investigators, an interagency approach to Federal administration with NSF as the primary sponsor, expanded industrial and foundation support, and modernization of university curricula, faculty, and programs.

● National Research Council. Richard B. Curtis, Study Director

The Invisible University: Postdoctoral Education in the United States

National Academy of Sciences. Washington, D. C. 1969.

This report is the result of a study conducted, with the advice of an Advisory Committee from 1966 to 1969, by the Office of Scientific Personnel of the National Academy of Sciences-National Research Council. The main conclusions and recommendations of the study were: postdoctoral education serves a variety of purposes, but has certain common themes; the humanities play a comparable role to the sciences in the postdoctoral field only in the senior postdoctoral area; postdoctoral education is a useful and healthy development, both after the doctorate and later, for senior scholars; an appointee should be regarded as one in the process of development--not as a means to accomplish other ends--for the university he is an essential part of the educational scene and faculty members should give him every opportunity and encouragement to develop as an independent investigator. Most, but not all postdoctorals, participate in teaching and in research administration; the normal tenure is two years but final duration of appointment and the locality should be left to the individual and the basic criterion should be whether the experience will enhance the postdoctoral's progress toward excellence and independence in research. For other findings and recommendations, the original source should be consulted.

● Odegaard, Charles E.

Humanistic Aspects of Science

Science, Government, and the Universities. University of Washington Press. Seattle. 73-83. 1966.

Author holds there is a need for a resurgence of the humanistic aspects of teaching in all fields, not humanities alone. Students want to talk about the moral implications of the knowledge acquired and dispensed, and need more conversation with and attention from the faculty.

● Page, J. Boyd

Graduate Work in the Natural Sciences

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 91-101. July, 1969.

Page traces the history of the natural sciences in graduate study and indicates that it was in these fields that the first graduate work in the United States and even in Germany began. Our big public institutions have specialized in the sciences; science has been fostered by Federal funding, and will continue to receive this support in the future. The author: estimates that 60% of all Ph.D.'s will be in the sciences by 1976-77; favors a total Federal funding for science under a single agency; recommends innovations in Ph.D. programs, particularly to shorten completion time; opposes a nonresearch doctorate in science because science is research-oriented; and feels that postdoctoral work should be encouraged but an additional degree beyond the Ph.D. is not warranted.

● Rees, Mina

Efforts of the Mathematical Community to Improve the Mathematics Curriculum

Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 228-233. 1965.

This essay centers on a discussion of a professional society to raise the standards of teaching of mathematics from elementary through the college level, to disseminate new textbooks on new concepts, and to explore the possibility of preparing additional college teachers via the D.A. degree (which was subsequently dropped).

● Roose, Kenneth D., and Charles J. Andersen

A Rating of Graduate Programs

American Council on Education. Washington, D. C. 1970.

This sequel to the 1966 report, "An Assessment of Quality in Graduate Education," is in methodology essentially a replication, but the format and emphases are quite different since it includes seven additional disciplines, 25 more institutions, and rates the changes taking place during the last five years as "better," "little or no change," "worse," or "insufficient information." The most dramatic improvements since 1964 have been in the quality of the graduate faculty overall, a notable improvement in the South, and general upgrading of a number of programs. In general, however, those institutions rating the highest in 1964 maintained their positions. Five recommendations are offered: avoid creating or reinforcing a hierarchy of institutions by using the scores and descriptive adjectives they received in this

survey, but emphasize instead the improvements made in the last five years; avoid further enhancing of graduate education at the expense of undergraduate programs by using with caution the updated ratings; avoid the apparent duplication, particularly in public institutions, of program resources, and stress state and regional planning to raise program standards selectively in individual institutions; eliminate or improve substandard programs; and respond to the need for a national policy for Ph.D. training to control production and quality (present programs and schools are adequate).

- Ruggles, Nancy D., editor

Economics

The Behavioral and Social Sciences Survey. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 1970.

This book is one of a series by the Behavioral and Social Sciences Survey (conducted through the Committee on Science and Public Policy of the National Academy of Sciences and the Problems and Policy Committee of the Social Science Research Council) whose objective was both to review and appraise the behavioral and social sciences and to provide a basis for a national policy to strengthen and develop them. Recommendations made in this book concerning the graduate education of economists were: economics departments should modify their programs to provide more training in research methods and greater acquisition of research tools (mathematics, statistics, econometrics, computer programming), and more research experience during the first two years of graduate study through participation in workshops and in research projects.

- Sanders, Irwin T., and Jennifer G. Ward

Bridges to Understanding: International Programs of American Colleges and Universities

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1970.

This is the third in a series of profiles sponsored by the Carnegie Commission on Higher Education; the authors chart the vigorous rise and development of international programs in the United States since World War II and the skepticism about international programs in the early sixties. Current organizational and financial crises, resulting from the change of foundation and Federal posture for support and the poor articulation and structure of international programs on most campuses, are stressed. Many of the colleges and universities have yet to face the basic question of whether these programs are integral or peripheral to the educational enterprise. The report and role of international programs are organized around three major parts: the student's broadening horizons, participation in the off-campus community, and the changing context of international programs. Implications of the study for those involved (trustees, presidents and administrators of institutions, the faculty, students, foundations, legislators,

government officials, and citizens) are emphasized. The authors conclude their report with recommendations based on these implications for the improvement of international programs.

● Secrest, Leigh

The Rationale for Polydisciplinary Programs

Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 87-90. December, 1969.

The author accepts the position that the struggle between Germanic and Socratic educational traditions lies behind the ferment on campuses. This same struggle is reflected between departments and polydisciplinary units, with the latter striving for relevance to problems of the real world and the former maintaining their traditional delivery of knowledge. Secrest suggests this should be a progression rather than a struggle and that from it a polydisciplinary approach will inevitably occur due to demand of society's problems. Examples of the development of a polydisciplinary approach are given for science and area studies; the actual push for such an approach results from the funding patterns for forming problem-oriented institutes within the university by virtue of the link between application of academic expertise to problems of Federal agencies. Secrest believes that polydisciplinary efforts are the natural adaptive response of intellectual man to problems presented by the real world, that this approach deserves study and acceptance, and it should be moved from the research center into the classroom.

● Smith, Allan H., and John L. Fischer, editors

Anthropology

The Behavioral and Social Sciences Survey Series. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 1970.

This book is one of a series by the Behavioral and Social Sciences Survey (conducted through the Committee on Science and Public Policy of the National Academy of Sciences and the Problems and Policy Committee of the Social Science Research Council) whose object was both to review and to appraise the behavioral and social sciences and to provide a basis for a national policy to strengthen and develop them. Two suggestions were made in this book concerning the graduate education of anthropologists: the student program needs to be flexible in that graduate students should not be required to take courses relevant only to their specialization but should be allowed and encouraged to take relevant nonanthropological courses (e.g., statistics, sociological research, soil morphology); and field work should be recognized as being an essential part of graduate training in anthropology, with the length of time in the field depending on the area of specialization.

● Terman, Frederick E.

A Study of Engineering Education in California

Coordinating Council for Higher Education. Sacramento. March, 1968.

This study of undergraduate and graduate engineering programs in the United States and particularly in California discusses the current trends, quality, needs, and costs of these programs. Graduate education in engineering has grown rapidly since World War II but the distribution geographically has not been uniform. The author discusses expansion of graduate engineering opportunities but stresses that only if adequate student support is available should expansion occur. Moreover, if the entire country is considered, there is an excess capacity for graduate training in engineering, but at the same time there does not appear to be a shortage of engineers to fill the needs of the nation. California produces a larger percentage of graduate engineers than the nation as a whole and it also has three of the top engineering schools in the nation. Costs of engineering education are detailed and he concludes that larger departments and larger classes do not dilute quality but do reduce costs. Each undergraduate engineering program on a university campus needs to be accompanied by a graduate program leading to the M.S. and Ph.D. degrees. Master's level work is justified at state colleges only where there is an adequate industrial base.

● Terman, Frederick E., and Glenn E. Reeling

Engineering Education in New York

The State Education Department. The University of the State of New York. Albany, New York. March, 1969.

After developing the thesis that engineering education is a force for economic growth and presenting the overall view and background of engineering education in the United States, the authors develop a detailed description and analysis of the current engineering schools in New York State and recommend a plan for the future. In brief: particular fields should be strengthened and not broadened to many diverse fields, institutional programs should be made available to industrial part-time employees, classes should be enlarged and more students enrolled, full-time study to the Ph.D. should be encouraged and supported, modern media should be used, statewide traineeship programs should be established and the strong programs and schools strengthened. State professorships in engineering on a competitive basis are recommended along with expansion of physical plants, equipment and research support. The cost of implementing the recommended package is $6 million the first year, escalating to $18 million by the sixth year.

- Weaver, C. E.

  Changing Identity of Graduate Earth Science Education

  Georgia Institute of Technology. Atlanta. 1968.

  Thirty-two leaders participated in a conference under the chairmanship of C. E. Weaver, sponsored by NSF and held at Georgia Tech. The major changes taking place in graduate education in the earth sciences were evaluated in formal presentations and discussions. The background, principles, and procedures of the physical sciences were considered to be paramount in developing new approaches and programs. Specialization of students as well as departments was encouraged, with a development of depth recommended for a better chance of success for most schools. Few departments can satisfy well the need to train researchers, practitioners and teachers, and a regional approach--except for the large universities--was recommended. Many of the recommended changes were more revolutionary than evolutionary in nature.

- Young, Francis A.

  Educational Exchanges and the National Interest

  The ACLS Newsletter, Volume XX, No. 2, 1-18, 1969.

  Young reviews the history and development of international exchange programs in this country--the philosophy, objectives and achievements realized--with major emphasis given to the Fulbright-Hays Program. The consequences of the drastic cutbacks in 1969-70 and their implications for the future are discussed. It is urged that these programs be strengthened and supported as part of a long-range foreign policy goal both as a service to government and a service to education--which have a common aim.

- Ziegler, Jerome M.

  Continuing Education in the University

  The Contemporary Jniversity: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 130-151. 1966.

  Evening colleges and extension divisions resemble each other in the kinds of clients served--fully employed adults and persons who had interrupted their education. Evening colleges offer adult degrees and service to the entire community. New concept places emphasis on liberal education in contrast to vocational or professional education.

RESEARCH: TYPES AND PROBLEMS

● Alpert, Daniel

The Role and Structure of Interdisciplinary and Multidisciplinary Research Centers

Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 75-81. December, 1969.

As part of a panel discussion on Inter- and Transdisciplinary Programs, Alpert defines and discusses three different categories of organizations in universities: cross-disciplinary--where research interest develops between two or more adjacent disciplines and if successful they evolve to new departments; multidisciplinary centers--where individual scholars from different departments or disciplines share common facilities, common research approaches, or a common environment and where the director serves as coordinator and spokesman for the group; and interdisciplinary centers--where the prime focus or function is on a broad societal problem calling for the insight of experts from several disciplines to reach a solution--requires a strong interdisciplinary leader for success. It is concluded that: only a small number of such centers have become truly distinguished focal points for interdisciplinary activities; future success of such efforts depends on whether an institution is capable of changing its values and structure to accommodate the problems posed by society; the university must respond to societal problems or it will not survive; and not-for-profit and governmental and industrial laboratories may be better suited for interdisciplinary research.

● Henle, Robert John, S.J.

The Dimensions of Graduate Study

Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 41-48. December, 1969.

Henle argues for broad scholarship in graduate study and feels that research is an essential component of a doctoral program and understanding of a discipline; hence he opposes the proposition of a "teaching" graduate degree. He visualizes a three-fold division of research: problem- and mission-oriented, area-designated research, and "free-wheeling" research. He favors the latter but laments that it is being squeezed out of our universities and intellectual life by mission-oriented and area-designated research which contribute to the current disillusionment of our students.

● Kidd, Charles V.

American Universities and Federal Research

The Belknap Press of Harvard University Press. Cambridge, Massachusetts. 1959.

The central thesis of this book, written before the current crisis in higher education, is that large-scale Federal financing of research has set in motion irreversible forces that are affecting the nature of universities, altering their capacity to teach, changing their financial status, modifying the character of the Federal administrative structure, establishing new political relations, and changing the way research itself is organized and conducted. Kidd's penetrating analysis of the forces at work and their potential consequences have subsequently been mainly validated. He decries the lack of a focal point within the Federal structure and in the Executive Branch, where the total needs and resources of the universities can be presented, or where the multitude of Federal research activities can be evaluated. Kidd recommends a Science and Technology Office attached to the President analogous in structure and function to the Council of Economic Advisors, and concludes that the national will to give education first priority to foster excellence in all fields is the most important task facing the United States in the future.

● Kidd, Charles Vincent

New Government-University Relationships in Research

The Journal of Higher Education, Volume XVI, 3-6, April, 1960.

Kidd traces the Federal government-university partnership in research, particularly the pertinent problems arising from this relationship since World War II, and the importance of the partnership since 95% of all Federal research funds in 1960 to higher education went to universities. Although events subsequent to 1960 have modified the trends and statistics cited, the major conclusions and recommendations made are still valid today. Universities must safeguard their freedom and exercise some degree of control over Federal funds to prevent these from dominating their programs and policies; this takes strong university administrators not afraid to supervise critically what proposals are submitted, accepted or rejected, and to maintain the proper balance between teaching and research. In general, the partnership, in spite of its faults, has had mutual benefits.

● Sawyer, Ralph A.

The Graduate Student and the University Research Program

The Graduate Journal, Volume VII, No. 2, 317-324, Spring, 1967.

This paper was given on the occasion of Sawyer's retirement from the University of Michigan. He covers 11 major observations in his discussion and analysis of the graduate student in relation to the university research program. This program has been the subject of much recent discussion and examination with the conclusion that although there are features that need change or redirection, it is best not to abandon the Federal programs while effecting the reforms needed. Graduate education and research since World War I has led to rapid increase in trained manpower which permitted the achievements and productivity on all fronts since World War II. Expenditures on R & D since World War II have increased about 15%/year causing problems for the universities but also real benefits. The problems can be solved by Congressional action or by the universities themselves. Institutional grants are favored and much of research money in the future should be used as institutional grants. Federal support of research should include the valid indirect costs. Congress should encourage allotment of more research money to smaller institutions. Research and teaching go together and students should be involved in research. The distribution of students among the various fields has changed little in the last 40 years. Areas other than science and engineering are gaining in support. Research programs of the United States have been a great stimulus to both graduate and undergraduate education.

M A N P O W E R

DEGREE PRODUCTION

● Alberty, R. A.

Discussion of Doctorate Productions to 1976-1977

Massachusetts Institute of Technology. Cambridge, Massachusetts. January, 1970. (Mimeographed.)

This is a discussion and analysis of potential doctorate production in the 1970's, based on two principal sources: USOE published projections by Simon and Fullan and NSF's projections, Science and Engineering, Doctorate Supply and Utilization, 1968-1980. In general, Alberty concludes that for the physical sciences, biological sciences, mathematics, and engineering the projected figures are too high. Present and projected trends in Ph.D. production rates are not likely to produce an "oversupply," but students must be offered options in their graduate programs in order to engage in different activities other than basic research careers.

● Aurbach, Richard H., et al.

Men and Women in the Biosciences--A Twenty-five-Year Analysis of Doctorate Recipients

Federation Proceedings, Volume XXIII, No. 5, 1177-1191, September-October, 1964.

This report, covering the period between 1937 and 1961, analyzes doctorates in the biosciences. The data used were obtained from The Doctorate Records File of the Office of Scientific Personnel of the NAS-NRC and from the USOE. Pertinent findings and recommendations are: almost 18,000 men and 2,500 women were awarded Ph.D.'s in the biosciences during this period; although the annual production of male Ph.D.'s more than tripled and the number of female more than doubled, the percentage of females receiving the degree declined during the quarter century; women showed an overall percentage decline at all levels of study in the biosciences even though there has been a substantial increase in the annual production of bachelor's and master's; 13% of all doctorate degrees awarded to women and 11% awarded to men are in the biosciences; there is utmost concern over the important loss of potential women scientists between the master's and the doctorate level. Five fields of biosciences lead the others in degrees awarded: biochemistry, botany, microbiology, physiology and zoology, with popularity in biophysics, genetics and phytopathology increasing more recently.

● Bridgman, Donald S.

Alternative Projections of Degree-Credit Enrollments and Earned Degrees in Higher Education U. S. 1966-1975

Commission on Human Resources and Advanced Education. Washington, D. C. February, 1970.

This staff research monograph reports procedures and methods, originating in 1966, developed and used by the Commission on Human Resources and Higher Education for deriving projections of degree credit enrollments and earned degrees in higher education. The procedures and methods used are described and 28 tables of data using the procedures are included; although based on past data of USOE, the methods used are different and the variations employed are described. U. S. Bureau of the Census data are used in deriving total enrollments.

● Bryant, James W.

A Survey of Black American Doctorates

Ford Foundation. New York. 1970.

A survey of Negro Ph.D.'s conducted by the Ford Foundation showed: that less than 1% of Ph.D.'s are Negro; 12.7% are over 60 years of age and 9.4% are under 35; the majority received their undergraduate training at black colleges; and the median time to obtain the Ph.D. was 13 years compared to 7.5 years for Ph.D.'s in general, mainly due to finances. Black Ph.D.'s are employed as follows: 85.4% in colleges, mostly black (54.9% are in education and social sciences), 5.4% are in government, 4.8% in service agencies, and 2.7% in industry. The prospects for the future, despite current assistance programs, are not bright unless these are expanded, and the report concludes that the number of Ph.D.'s awarded to Negroes will still constitute less than 2% of the total by 1973, even with a high demand for their services.

● Cartter, Allan M.

Scientific Manpower Trends for 1970-1985, and Their Implications for Higher Education

Paper presented at a meeting of the American Association for the Advancement of Science, Chicago, December 27, 1970.

In this paper prepared for the annual meeting of the AAAS on December 27, 1970, Cartter restates his earlier prediction that there would be an oversupply of Ph.D.'s by the early 1970's. Until now he had not anticipated that it would begin this early, because the full fury of the current constraints were unknown. The capacity of graduate education in our universities is 30-50% larger than we can effectively use in the next decade and early in the 1980's. In the 1970's only about one in four doctorates will find suitable

academic employment, and in the 1980's it could be less than one in ten. Underemployment rather than unemployment of Ph.D.'s is the problem. Cartter urges better planning for the manpower needs of the nation and by a non-governmental agency responsible for this. Graduate schools should decrease their enrollment goals, their commitment to new programs and their continuance of existing uneconomical small programs. Tenure regulations and earlier retirement policies should be restudied in the light of making them more flexible and the government should establish some system of minimum support to the best schools, or if this is too controversial, to the best departments in a discipline.

● Creager, Joan G., and Lindsey R. Harmon

Backgrounds and Early Careers of Engineering Doctorate Recipients

Journal of Engineering Education, Volume LIX, No. 3, 243-250, November, 1968.

From 1958 to 1966 the number of doctorates in engineering has more than tripled, with the largest number in civil and sanitary engineering. At the time of the doctorate, the typical engineer is male, 31, has spent five of the seven years since his bachelor's registered for graduate work, and has acquired four years of professional experience. Colleges and universities employ about 45% of the engineering doctorates, business and industry 40%, and the remaining 15% are employed in various categories. Of those employed in academe, 1/2 are primarily teachers, the next highest portion combines teaching and research, and a small percentage serve as administrators.

● Eells, Walter C.

Leading American Graduate Schools, 1948-1958

Liberal Education, Volume XLVI, 16-20, March, 1960.

This article gives a list of the leading graduate schools as of 1960. It is based on the number of doctorates conferred in 54 fields of graduate study during an 11-year period. The five leading graduate schools are summarized under the broad areas of the humanities, biological sciences, physical sciences, and the social sciences, and relative changes in doctorates granted in these broad areas are described.

● Falk, Charles E.

Projections of the Doctorate Population

Paper presented at the Tenth Annual Meeting of the Council of Graduate Schools in the United States, Miami, Florida, December 2-4, 1970.

Falk presents the National Science Foundation's revised projections for the utilization and supply of science doctorates in the United States by 1980. The accompanying data indicate that, except in engineering, a rough balance should exist by 1980 in the supply and demand of science Ph.D.'s. While a gross shortage of science doctorates is not likely, specific subfields could experience a shortage; therefore, continuous evaluation of the situation needs to be made. Student disenchantment with science careers is one factor that could cause a Ph.D. shortage. Projections clearly indicate that as many as 1/2 of the doctorates produced between now and 1980 will be employed in nongraduate academic positions and non-R & D positions (practitioners, managers and administrators, post-development scientists and engineers in industry, or teachers in two- and four-year colleges). In view of this trend, it is recommended that graduate schools broaden their curricula to meet the needs for developing nonresearch degree programs and establishing practitioner degrees, such as the Doctor of Arts degree.

● Frankel, Martin

Projections of Doctor's Degrees to 1979-80

Paper presented at Association of American Universities symposium, Washington, D. C., April 2, 1971.

The National Center for Educational Statistics has made projections of earned doctor's degrees according to sex and the field of study for 1970-71 through 1979-80. The projections are based on an assumption that the trend of the ratio of degrees to population for the past 11 years will continue ten years into the future. Individual factors such as government financing, draft calls, and the job market were not taken into account. Both projections were based on a straight line extrapolation of the data from 1959-60 to 1969-70 for ten years into the future. The projections for 1979-80 indicate 62,500 earned doctor's degrees with 54,600 earned by men and 8,000 by women; of the total (32,120) in the sciences, 3,970 are projected in mathematics and statistics; 12,650 in engineering; 6,870 in the physical sciences; and 7,310 in the biological sciences. The total in the social sciences and humanities is projected at 30,380.

● Henze, Robert E.

Long Term Planning Seen Vital to the Supply of Scientists

The Journal of Commerce and Commercial, Volume CCCV, No. 22275, 7A, September 14, 1970.

This article's main theme, depicted graphically, is that an appreciation of the shape, content, and length of the academic pipeline--ranging from pre-school to graduate school--is particularly relevant to current discussions of doctoral training, the future supply and demand of Ph.D.'s in the sciences and engineering, and the potential long term impact on the nation's economic health and well-being. The number of students in this pipeline at any given time or place should provide valuable information for predicting future output. Any substantial changes in the pipeline would have to be implemented now if they are to have any effect on the training of doctorates emerging in the late 1970's. There is a need for continual assessment and planning to prevent precipitous action at any point in time which would affect the flow through the pipe. The nation needs a stable policy to ensure adequate supply of highly trained manpower.

● Lehmann, Phyllis

The Research-Doctorate Pipeline Is Still in High Production

News Report, Volume XXI, No. 4, 2-3, April, 1971.

Hall and Harmon of the Office of Scientific Personnel of the NAS-NRC comment on the fact that despite the gloomy job market outlook, the Ph.D. production rate had its greatest increase since World War II in 1970, and growth is expected to continue. They believe that: in general, Ph.D. production does not respond quickly to economic changes; the job panic has been overplayed, most Ph.D.'s will find jobs, though possibly not their first choices or in their specialities; students deterred from entering certain fields or decreases in financial support for those fields may cause future shortages; and increases in postdoctoral work in some fields do not necessarily reflect the job picture. There is little danger of Ph.D. overproduction if educational standards remain high, predictions of society's needs are realistic, and Ph.D.'s choose programs for careers other than basic research.

● Magoun, H. W.

The Productivity of Master's and Doctoral Degree Programs in the University of California

Working Paper, Unpublished. Dean, Graduate Division, University of California, Los Angeles. March 15, 1968.

Magoun reviews the productivity of master's and doctoral programs in the University of California as a basis for recommending changes or continuing the status quo. The ratio throughout the system is about 25% doctorates to 75% master's degrees, but the ratio varies among schools. The author concludes that, with the availability and use of the Candidate of Philosophy degree and the availability of master's programs in the state colleges, a rethinking of the utility of the master's degree in the university system is necessary and that the University of California should concentrate on doctoral study.

● National Research Council. Office of Scientific Personnel

Summary Report 1970 Doctorate Recipients from United States Universities

OSP-MS-4. National Research Council. Washington, D. C. March, 1971.

This summary report is based on data obtained from the Survey of Earned Doctorates questionnaires. There were 14.4% more doctorates (29,436) granted in FY 1970 than in the previous year making it the year of the highest growth rate since the immediate post World War II period. Over 3/4's (78.8%) of all doctoral recipients plan to enter regular employment following graduation, about 1/8 (13.1%) to postdoctoral study, 1.7% to the military, and 1/16 (6.4%) uncertain. These ratios vary only slightly from 1969. Variations for postdoctoral study by field are noteworthy: natural sciences--33%, humanities, arts and professions--1.8%, and social sciences--7.7%. Of those entering regular employment: 70% found employment in educational institutions, 15% in business and industry, 9% in government, and 3% in nonprofit organizations. The major employers of chemists and engineers were industry and business.

● National Science Foundation

Science and Engineering Doctorate Supply and Utilization 1968-80

NSF 69-37. U. S. Government Printing Office. Washington, D. C. 1969.

In January of 1968, it was estimated that 147,000 Ph.D. level scientists were employed in various activities in the United States: nearly 3/5's (87,000) were employed in the academic sector, 1/4 (39,000) were in private industry, and the remaining 1/8 were employed by government (14,000) and other organizations (7,000). From this base, the 1980 supply is projected, using Office of Education figures and allowing for replacement, attrition and other factors, at 350,000 doctorates. Utilization projections were made

using two models: the "basic" minimal utilization of 275,000 to 300,000 science doctorates and the "improved" utilization of 390,000. The expected production lies about halfway between the "basic" and the "improved" utilization projection figures, indicating an overall surplus of doctorates by 1980. It was concluded that analyses point out: that significant numbers of Ph.D.'s are likely to be engaged in activities markedly different than presently practiced, that Ph.D. candidates should be offered options in graduate programs better suited for their new activities, and that students must not be educated with false aspirations for solely research careers.

● Pelczar, Michael J., Jr.

The Expanding Doctoral Population: A National Asset or a National Extravagance?

Graduate School Chronicle for the Graduate Faculty and Students at the University of Maryland, Volume IV, No. 2, Special Issue, 13-20, April, 1971.

Pelczar assesses the current status and financial plight of graduate work with particular attention to doctorate study and production. He notes, as have others, that about 2/3's of United States' institutions are already facing or soon will be in financial difficulty with graduate programs feeling the pinch the worst; graduate costs are estimated to quadruple in the next decade. Grave doubts are expressed that society can utilize the predicted number (50,000-70,000) of doctorates to be awarded by 1980, and greater options, practitioner and teaching oriented programs for all fields to better match the inherent abilities, aspirations and potential opportunities for the products are advocated. An employment survey of the 1969-70 doctoral recipients at the University of Maryland was conducted with the results varying little from national figures, except that more (18.2%) entered government work (probably due to proximity to Washington).

● Rosenthal, Neal H., and Janice N. Hedges

Matching Sheepskins with Jobs

Monthly Labor Review, Volume XCI, 9-15, November, 1968.

Based on 1966 statistics from the Bureau of Labor Statistics, attempts are made to determine if the supply of college degree recipients will be in balance with projected job demands during the 1966-75 period. Projections are made assuming that changes in economic growth, advances in science and technology, consumption and social patterns, and R & D and defense expenditures, will continue at the same rate they have in recent years. The numbers of bachelor's and first professional degrees are estimated to increase 71% and graduate degrees over 100% of the total produced in the last nine years. Based on supply and demand projections by fields, the professional and technical fields, health-related fields, the managerial and sales fields, will be areas of greatest demands. There will be a surplus of graduates in education, especially in the elementary and secondary fields. Potential shortages in engineering and the physical sciences, but a surplus in the life sciences and mathematics, are indicated.

● Terman, Frederick E.

The Supply of Scientific and Engineering Manpower: Surplus or Shortage?

Unpublished Paper prepared for President's Science Advisory Committee (PSAC), Subpanel on "Academic" Science, June 9, 1970.

This report shows that new trends are developing in respect to the U. S. supply of scientific and engineering manpower; students appear to be losing interest in science and engineering at the same time that concern is being expressed that an oversupply of Ph.D.'s is being produced. Background data on the supply and demand in these areas are presented in perspective to bachelor's, master's and doctorates being produced, the potential effects of current trends in graduate education, and in terms of the factors governing the achievement of realistic national goals in the 1970's. It is concluded that if present trends continue, there will be definite shortages by 1980 unless corrected; the total number of Ph.D.'s should be kept at 1968 levels and training modified to meet the demands of a changing society and world; and every effort should be made to increase the production of the M.S. in engineering.

● U. S. Department of Labor. Bureau of Labor Statistics

College Educated Workers, 1968-80: A Study of Supply and Demand

Bulletin 1676. U. S. Government Printing Office. Washington, D. C. 1970.

This report is intended to indicate "what conditions can be expected if current supply patterns continue," not to predict the future. Based on certain assumptions of supply and demand conditions implied in the Bureau's basic model of the economy for 1980, including openings due both to growth and replacement, 17 selected occupations requiring a bachelor's or advanced degree and seven selected occupations requiring junior college training are analyzed in detail. The overall conclusions are that: the supply and demand for college graduates as a whole is expected to be in relative balance during the 1970's; imbalances may occur in many individual occupations if past study and work patterns continue; among individual fields, perhaps the most dramatic change is in elementary and secondary school teaching in which more than an adequate supply is expected; the number of women graduates is expected to increase, as is their participation in certain fields, but the demand is not expected to absorb the increase because of the high proportion of women in teaching.

ENROLLMENTS

- American Council on Education

  Enrollment Last Fall Was 7.9 Million, Up 5.3 Percent, USOE Says

  Higher Education and National Affairs, Volume XIX, No. 22, 6, June 21, 1970.

  Total fall 1969 enrollment (degree and nondegree credit students) at colleges and universities was 7,976,834, an increase of 5.3% over 1968 according to National Center for Educational Statistics (USOE). This exceeded previous estimates of both USOE and the Census Bureau. NCES figures, not yet published, show a slight increase in number of women enrolled, a continued decline in enrollment at private institutions (2,088,962 or 26%) and a corresponding increase at public institutions (5,887,872 or 74%, up 2%). Men enrolled were 4,723,684 or 59%, and women 3,253,150 or 41% compared to 60% and 40% in 1968.

- The Carnegie Foundation for the Advancement of Teaching

  The Flight from Teaching

  1963-1964 Annual Report. The Carnegie Foundation for the Advancement of Teaching. New York. 1964.

  The problem is delineated: it is estimated that college enrollment will almost double from 1965 to 1980; we will need more teachers than are projected to be produced since only about 50% of Ph.D. recipients go into teaching; large Federal research expenditures and consulting have diverted time and energy of faculty from teaching with the result that classroom hours per teacher have dropped significantly since 1930. Possible answers are offered to the problem: expand graduate school output; invent new type of doctoral degree; use graduate students and emeriti professors; increase fellowship aid to women, the poor and minority groups; utilize faculty better; and restore the status of teaching to its proper place.

- Chemical and Engineering News

  Grad Enrollments Down

  Chemical and Engineering News, Volume XLVIII, No. 43, 36, October 12, 1970.

  A Chemical and Engineering News survey of 54 chemistry departments shows that in 30 departments there was an average decline of 30% in enrollments. Decreased Federal funding for chemistry has replaced the draft as a major factor in reducing enrollments. There is a funding shift to State sources but this will not aid the private institutions.

- Haggstrom, Gus W.

  The Growth of Graduate Education in the Post-Sputnik Era

  Paper presented at Association of American Universities symposium, Washington, D. C., April 2, 1971.

  Haggstrom believes that the primary factor influencing the growth of graduate education since Sputnik has been the growth in the numbers of college graduates during this period which resulted from the increase in the college age group, more finishing high school, and more entering college. Although Federal expenditures on graduate education soared during this period, he attributes only a small part of the growth to these expenditures. According to three series of projections based on different assumptions given in the paper, graduate enrollment will continue to rise through the 1970's, but at a slower annual rate than experienced in the 1960's. About 1985, graduate enrollments will level off in all three sets of the projections, with slight declines anticipated in the late 1980's due to the reduced birthrate beginning about 1961. Doctorate production is also forecast to increase during the 1970's but at a slower rate than the 12% per year of the 1960's. Since the future demand for college teachers in most fields can be more than satisfied by the 1970 rate, institutions and students should modify or adapt doctoral programs to increase employment chances and assess alternative solutions.

- Science

  Draft Caused Drop in Graduate Science Enrollments

  Science, Volume CLXV, No. 3889, 162, July 11, 1969.

  The Scientific Manpower Commission conducted a survey of departments granting Ph.D.'s in chemistry, physics and physiology to assess the situation at the close of 1968-69. Responses from 304 of 568 departments indicate that 15.4% of the first-year male students and 11.8% of the second-year students had been inducted prior to June, 1969. There was a wide difference between departments, with some losing 71% while others lost 3 or 4%. Only the students leaving the institutions for the draft were counted. Female enrollment rose from 10 to 30% during the period.

● Thompson, Ronald B.

Enrollment Projections for Higher Education 1961-1978

Enrollment Studies Committee of the American Association of Collegiate Registrars and Admissions Officers. Available from the American Council on Education. Washington, D. C. 1961.

Estimates of enrollment for higher education, 1961-1978, are projected using different assumptions for the college age group (18-21 year old). Figures, which are now largely outdated, are given for the total United States, for each state and the District of Columbia.

● U. S. Department of Commerce. Bureau of the Census, by John K. Folger and Charles B. Nam

Education of the American Population

U. S. Government Printing Office. Washington, D. C. 1967.

This monograph describes the educational status of the American population, based on 1960 Census data and other information, and analyzes the relation of school enrollment and educational attainment to other socio-economic characteristics. History of enrollment growth in the United States divides into three general periods with distinct boundaries: 1840-1900--development of universal elementary education, 1900-1950--development of universal secondary education, 1950 to now--expansion of higher education when one-half or more will attend college. Population and enrollment projections are made and tabular data given from 1965-1985: elementary and secondary enrollments will grow slowly from 1965-1975; after 1975, elementary enrollment will grow more rapidly again, but growth in enrollment below the college level will be less in the late 1960-1970's; college enrollment will grow most rapidly from 1965 to 1970 and then more slowly in subsequent five-year periods up to 1985.

● U. S. Department of Health, Education, and Welfare. Office of Education

Education in the Seventies

Planning Paper 68-1 of the Office of Program Planning and Evaluation. U. S. Government Printing Office. Washington, D. C. May, 1968.

These HEW Planning Papers, largely based on 1965 data, project and discuss enrollments and allied problems from pre-school through graduate work. The outlook for education to 1975 reviews enrollments, supply of teachers, past trends in expenditures, projection of educational expenditures from 1970-1975, and the fiscal outlook. The projections and data are possibly subject to criticism as not being relative to today's conditions because of spiraling inflation, general economic recession, teacher militancy including demands for higher salaries, unemployment increase, decline in the birthrate, and clamor for open admissions.

NEEDS AND PRIORITIES: NATIONAL, EMPLOYER AND FIELD

● American Geological Institute. Committee on Manpower

Manpower Supply and Demand in Earth Science 1969-1974

American Geological Institute. Washington, D. C. 1970.

Industry employed 70% of all professional earth scientists according to estimates made at the beginning of 1969. It is projected that the petroleum industry will need 18% fewer scientists, particularly geologists, over the next five years; this may be offset partially by substantial increases in the mining and service industries. Government's needs are estimated to increase by 25% and educational needs for faculty by 38% by the end of 1974, but the overall increase in total employment is expected to be no more than 4%. An apparent shortage of Ph.D. degree holders in all areas, except geophysics, is expected to continue through 1974, but the projected number of bachelor's and master's degrees exceeds the demand.

● American Physical Society. Economic Concerns Committee. L. Grodzins, chairman

The Manpower Crisis in Physics

American Physical Society Bulletin, Series II, Volume XVI, No. 6, 736-749, June, 1971.

The Economic Concerns Committee, appointed in June 1970, was asked to examine what the American Physical Society could and should be doing to assist its members in the present situation and to assess the long-range implications for the profession. This first report of the committee describes the current manpower crisis in physics. Highlights of the study show that: about 4% of the Ph.D.'s that graduated in 1970 were unemployed; the sum of the unknown, unemployed, underemployed, and left-physics categories totaled 14% of the graduates; 38% of the new Ph.D.'s took postdoctoral type positions in the U. S., and 85% of this group went into educational institutions. Incomplete information indicates that almost 40% of the experienced Ph.D.'s seeking new jobs left the physics community. Predictions for the 1970's are: there will be a severe oversupply of Ph.D.'s in physics in the next few years, during this time there will be a severe imbalance between the aspirations of students and the opportunities which will exist, and the growth of physics faculties will be far below the need. The report concludes that the present manpower crisis is caused by the decrease in effective Federal funding for research and the economic downturn (recession-inflation). The Committee recommends nine actions that should be taken for the near future: new opportunities for physicists must be found, a larger share of jobs for Ph.D.'s will have to come from outside educational institutions, a National Placement Service based on field representatives working under a central facility should be implemented, the physics community should be informed of the present situation, physics departments should tighten their standards for the Ph.D., physics departments should examine and broaden their training programs, financial inducements to channel students into fields of little employment potential should be reduced, the number of nationally awarded

fellowships for the most capable students must be maintained, and students should be counseled to undertake broad programs in fundamental preparation.

● Anderson, R. D.

Are There Too Many Ph.D.'s?

The American Mathematical Monthly, Volume LXXVII, No. 6, 626-641, June-July, 1970.

Anderson gives an in-depth analysis of the demands for Ph.D.'s in the mathematical sciences by all potential users. He concludes that an overall surplus does not presently exist, but there will be a surplus in a few years, particularly within academic institutions since the need for faculty expansion has ceased and will not be repeated in the foreseeable future. Reasons for the decline in demand are outlined and recommendations are made to combat the future problems expected for maintaining quality in basic mathematics and the alleviation of employment difficulties by a shift into applied mathematics and computer science.

● Boffey, Philip M.

Recession in Science: Ex-Advisors Warn of Long-Term Effects

Science, Volume CLXVIII, No. 3931, 555-557, May 1, 1970.

Boffey reviews testimony and data regarding the status of America's scientific community presented to the Senate Subcommittee on the National Science Foundation in April, 1970 by four former presidential science advisors, the Director of NSF, and the president of the National Academy of Sciences. One of the chief concerns was the proposed cut in Federal support of graduate students of almost 50% from that of FY 1970 to 1971; particularly hard hit would be the NSF Traineeship Program. The decision of the Administration was testified to be based on a surplus of EMP Ph.D.'s and a decline in the demand for them. McElroy stated that all graduate programs were being reviewed by NSF, OST, and BMB with a view toward changes in the 1972 budget and the consideration of the possibility of loans instead of traineeships. The oversaturated job market reported by AIP and others, was strongly refuted by Handler who cited the following NAS survey of January 1970 results obtained from 80% of all science Ph.D.-granting departments in 1968-1969: 1968--0.4% in irrelevant jobs and 0.7% unemployed, 1969--0.7% in irrelevant jobs and 1.1% unemployed. Handler's opinion was that the "scare" philosophy itself might jeopardize the future of science by driving young scientists from the profession; similar views were expressed by the former advisors. House and Senate subcommittees felt NSF must assume a more central role in preserving the science establishment; this view was shared by Handler and McElroy.

● Brode, Wallace R.

The Scientific and Engineering Manpower Problem of the Future

Manpower Comments, Volume VII, No. 4, 6-15, April, 1970.

The current small surplus of scientists and engineers is a result of the failure to coordinate supply and demand. Between 1970 and 1980 there will be continued surplus, while the demand will exceed the supply between 1980 and 2000. The problem then is how to utilize the surplus until it is needed. One solution is increased public services and R & D (e.g., pollution) to give scientists and engineers who prefer to remain in science and technology, rather than go into nontechnical fields, the opportunity to do so. Projections of degrees are confused by the changing definitions of science and engineering and these studies would be more accurate if one considered the entire age group and not just the student body (3.7% of the 22-year-old age group graduates in science and engineering). Future planning should take into consideration more effective utilization of talent and the provision of instrumental and technical assistance to conserve ability and improve production.

● Cartter, Allan M.

The After Effects of Putting the Blind Eye to the Telescope

Paper presented at the Twenty-fifth National Conference of the American Association for Higher Education. Chicago. March, 1970.

Cartter reviews and amplifies in retrospect his previous statements and publications concerning the supply and demand for college teachers. In brief, the shortage of Ph.D.'s that has existed for 30 years is over and Federal cutbacks in funds are not temporary; current conditions emphasize how inaccurately and poorly we have done our forecasting and planning--the changes were taking place but we were blind to them. The anticipated effects are: a slowing down of overall salary increases and a shift of the relative advantage to the senior professors; less mobility of academicians; an increased tendency toward unionization and a trend to lower the normal age of faculty retirement; increased attractiveness of teaching and greater stress on good teaching; availability of talent resulting in a reduction of student-faculty ratios but with financial pressures mitigating against this trend; rate of growth of graduate school enrollments will decrease in the next ten years particularly in the larger and more prestigious institutions; and great pressure on the private sector to survive--as state systems overexpand--with only those that provide superior graduate programs surviving.

● Chemical and Engineering News

Problems Beset Graduate Chemistry Education

Chemical and Engineering News, Volume XLIX, No. 12, 52-53, March 22, 1971.

The American Chemical Society's Educational Conference reports that the depression in chemistry enrollments and the shortage of jobs for chemistry Ph.D.'s could put survival of some of the newer departments in doubt. As the situation is not expected to change in the near future, recommendations for maintaining quality in chemical education are suggested. The possible need for the ACS to establish approval of qualified departments based on performance criteria such as faculty, program, budget, equipment, and library, as well as admissions standards for prospective students, is suggested. Other recommendations include the following: broader training in graduate chemistry programs, efforts toward the improvement of undergraduate teaching, encouragement of student-faculty research, and expansion of existing educational and manpower statistics to provide additional information and forecasting capabilities in the future. The role of the teaching assistant and the value of the T.A. program to both the department and the student are discussed. The Conference recommends that chemistry departments, although not widely guilty of the abuses to which T.A.'s are subjected, should take the leadership in reevaluating the T.A. system to provide for better supervision, training, evaluation by students and faculty, and for more recognition of the T.A.'s status. Experimentation with nonresearch oriented doctoral programs should be attempted, particularly for those who intend to teach in two-year colleges.

● Dure, Leon S.

More Graduate Students Are the Key to the Nation's Search for Scientists

American Mercury, Volume XC, No. 435, 113-116, April, 1960.

This paper gives 1960 arguments for increasing the scientific Ph.D.'s in the nation. Dure feels that funds should be spent to support science and scientists in the graduate schools, not in the public high schools. Some of the recommendations he suggests have been followed in the 1960's, e.g., larger stipends for graduate students, increased faculty salaries and a general encouragement of scientists to stay in scientific research.

● Duren, William L.

Are There Too Many Ph.D.'s in Mathematics?

The American Mathematical Monthly, Volume LXXVII, No. 6, 641-651, June-July, 1970.

Based on the rapid increase in the numbers of Ph.D.'s granted in the last decade in mathematics (from about 500 to 1,200/year), Duren discusses and differentiates between overproduction in terms of the economics of supply

and demand and from the educational viewpoint of not giving too much graduate education in mathematics. He believes that the answer calls for the rejection of special training to qualify graduates to take specific existing jobs after graduation and instead advocates giving them a broader, more fundamental, and more general education to prepare them to take unknown jobs--jobs which may not exist now. Reform of graduate education in mathematics is required along with Federal planning and support to produce more applied mathematicians, college teachers and industrial mathematicians--perhaps ten of this type for every research specialist.

● Engineers Joint Council. Engineering Manpower Commission

Demand for Engineers and Technicians--1966

Engineering Joint Council. New York. November, 1966.

This is an assessment of the nation's engineering and technological manpower resources based on the 1966 survey. Highlights are: demand appears to be greatly in excess of the projected supply of formally educated engineers, scientists and technicians; recruiting for graduate degree holders reached record highs in 1966 with openings exceeding applicants registered; and trends indicate continuing shortages in engineering enrollments as percentage of the total continues to decline.

● Engineers Joint Council, Inc. Engineering Research Committee. J. H. Holloman, chairman

The Nation's Engineering Research Needs 1965-1985

Engineers Joint Council, Inc. New York. 1962.

The Engineering Research Committee, with subcommittee reports, outlines the future needs for the engineering profession. Although defense research and development is necessary to maintain United States leadership, more R & D support should be channeled to studies on problems affecting people and society, and to maintain industrial leadership in international economic competition. No shortage of energy and mineral resources is anticipated as long as the United States has access to foreign sources of supply. Various aspects of the environment are discussed: general recommendations are made for an overall Federal environment agency formed from present agencies involved in environmental studies, state control agencies, and vastly increased research on the environment, especially in academic institutions. Other recommendations are: a coordinated attack on transportation problems; more engineers involved in health-related fields, science and education; cooperation with life scientists; an interdisciplinary approach in helping developing nations determine their technical needs; use of data processing to expedite the flow of technical knowledge; encouragement of the study of engineering; and cooperation between engineering societies to avoid duplication of effort.

● Hall, Wayne C.

Predoctoral Education in the United States: Current Parameters and the Data Base

Report on the Conference on Predoctoral Education in the United States. National Research Council. Office of Scientific Personnel. Washington, D. C. 9-35. November, 1969.

This background paper prepared for the Woods Hole Conference presents a general survey of the critical studies, projections and recommendations made during the 1960's on graduate education. Comparison of enrollment data, sources of financial support (including student stipend levels and projected funding needs), the current production and future needs for Ph.D.'s and other parameters of the present and future graduate data base are reviewed and discussed. The rapid growth in number of doctoral granting institutions, the rapid increase in full- and part-time students enrolled, the rate of Ph.D. production, and other past trends all suggest that the system is adequate to meet future requirements. However, although most authorities state that the nation's future needs for highly trained scientific manpower will increase, enrollment and support will decrease; therefore, new ways must be sought to reform the academic structure and financial support for graduate education. It concludes that there is little danger of producing an oversupply of doctorates as long as standards of education are not sacrificed, training for different roles in society is considered and planned, and postdoctoral employment expectations are not misrepresented to the students involved.

● Harrar, J. George

The Quality of the Future

An occasional paper of The Rockefeller Foundation. New York. 1966.

The theme of this paper, given as the commencement address at Emory University in June, 1966, is that quality, both external and internal, of the environment in which we live is paramount. Harrar describes the changing scene in America, the changes that have taken place in the external environment and the problems that ensued, and the challenges these changes present to the college graduate, particularly in the areas of pollution, population, and urbanization. The importance of education and the response of universities to these challenges in the future are stressed--with the final note being that the most serious danger comes from within. New creative leadership to provide the needed thrust and guidance rests with the college graduates of today.

● Lecht, Leonard A.

Manpower Needs for National Goals in the 1970's

Frederick A. Praeger, Publisher. New York. 1969.

This is a sequel to an earlier publication that estimated dollar costs of achieving the 16 national goals established and pursued by the National Planning Association for Priority Analysis. The overall conclusion is that if we continue to follow present trends of employment, training, education, etc., all attempts to implement national goals and solve societal problems will be hamstrung by substantial labor shortages, despite technology advances and automation. New programs will be crippled by manpower shortages unless planning is done now. To accomplish these goals by mid-seventies would require an employed civilian labor force of more than 100 million, up 10 million from present estimates, and the better use of women, nonwhites, older persons, and the handicapped. The nation's choice of priorities will determine the kinds of future jobs the economy will require. To achieve the 16 goals will require growth of 3.4%/year in civilian employment. Overall, the entire future growth depends on the growth of the GNP and the priorities established and implemented. In terms of manpower requirements and education and training there is a goal unique to education, but there is an interdependence with virtually all other goals. It is estimated that college enrollments will be 9.6 million by 1975 and expenditures for higher education will increase from 10 billion in 1964 to 29 billion in 1975.

● National Academy of Sciences. Committee on Science and Public Policy. Panel on the Plant Sciences. Kenneth V. Thimann, chairman

The Plant Sciences: Now and in the Coming Decade

Publication 1405. National Academy of Sciences. Washington, D. C. 1966.

Chaired by Thimann and prepared under the aegis of NAS's Committee on Science and Public Policy, this panel reports the current status and projects financial as well as other needs for the plant sciences to 1974-75. Some of the problems, responsibilities, and spectacular accomplishments from the viewpoints of the unifying principles of the subfields of biology and their importance to solving applied problems of agriculture, medicine and pharmacology are reviewed in Part I; these are followed in Part II by a detailed discussion of the natural subdivisions of the field as a basis for future planning. The report concludes with a statement of overall requirements and costs (based on past assumptions as to funding trends), including manpower training and support, research needs, special projects, and equipment and facilities. The entire plant sciences program as forecast and recommended would cost the Federal agencies $1,492,000,000 for the 1965-74 decade.

- National Manpower Policy Task Force

  Improving the Nation's Manpower Efforts

  A Position Paper. National Manpower Policy Task Force. Washington, D. C. February 12, 1970.

  The Task Force is a private, nonprofit organization of academic manpower experts devoted to the promotion of research in manpower policy. The paper represents a position statement and analysis of the three major proposals pending before Congress: the Steiger Bill, O'Hara Bill, and Government and Administration Bill. All three seek some form of state and local planning to adapt the use of funds to area needs and flexibility in working out specific programs. It is recommended that Congress enact legislation which embodies the best of the three bills; the programs affected by all three bills have been chiefly remedial, and enactment of the best in all three bills would be a significant step toward the development of a national manpower policy.

- National Science Foundation

  The Prospective Manpower Situation for Science and Engineering Staff in Universities and Colleges, 1965-1975

  NSF 67-11. U. S. Government Printing Office. Washington, D. C. 1967.

  The purpose of this report is to examine the future demand and supply situation for university and college staffs in the sciences and engineering. Student enrollment, level of research performed, and attrition losses determine personnel requirements. The current and future ratio of Ph.D.'s necessary to maintain quality staffs is about 50% for college and university staffs and 25% for medical scientists. Some predictions of the study indicate: a more than twofold increase in the number of doctorates produced by 1973-74, depending on continuation of recent trends in higher education; a decline in the proportion of science and engineering staffs with doctorates after 1965 due to increased requirements and a lag in production; junior and liberal arts colleges and universities with small research programs will be at a competitive disadvantage through 1975; a need to increase financial support of science and engineering education to meet personnel needs; and that by the end of the 1965-75 decade universities and colleges will be in a favorable position with respect to the employment situation for doctorates, due to a decline in the need for Ph.D.'s in industry and other nonacademic sectors.

● National Science Foundation. National Register of Scientific and Technical Personnel

Summary of American Science Manpower, 1968

NSF 70-5. U. S. Government Printing Office. Washington, D. C. January, 1970.

This summary of the most recent National Register questionnaire, based on an 84% return, indicates general characteristics of the respondents. About 300,000 were registered with 91% being men and 9% women. Chemistry, with 32% of the population, had the highest number of registrants. Thirty-seven percent possessed the doctorate and 87% were employed full-time: 40% in educational institutions, 32% by industry and business, 10% in the Federal government and 14% in other employment. Seventy-nine percent were under 50 years of age; the median annual salary for all fields was $13,200, ranging from $11,000 to $18,000.

● National Science Foundation. National Science Board

Graduate Education: Parameters for Public Policy

U. S. Government Printing Office. Washington, D. C. 1969.

This review of graduate education is concerned primarily with the review and analysis of institutions that offer graduate programs, their quality, and their financial support. Major issues of public policy involve the capacity of the educational system to meet the challenges of the next decade; the achievement, measurement and maintenance of quality in these institutions, and the spreading of educational capacity to ensure maximum benefits to society. Recommendations as to the role of the Federal government and the best way this role can be exercised in the planning, development, and support of individual institutions are delineated.

● Radner, R., and L. S. Miller

Demand and Supply in U. S. Higher Education: A Progress Report

The American Economic Review, Volume LX, No. 2, 326-334, May, 1970.

This paper is a progress report on a project, primarily supported by the Carnegie Commission on Higher Education, designed to estimate various supply, demand, cost, and technological relations in U. S. higher education. The aim of the project is to add to the scientific description and understanding of the education industry and to provide a set of related models that can contribute to the debate on policy issues. Overall, the project has essentially six component parts: estimation of student-teacher and other input-output relationships at the college and university level for a cross section of institutions, and estimation of student-teacher input-output relationships at the discipline level for a few selected public California institutions; a model relating dollar costs to various measures of activity; estimation of the demand for places by potential students as a function of several factors; a study of the supply and pricing of places by private

institutions; estimation of the stocks of educated manpower by various parameters and for a number of recent years; and a study of factors influencing the demand for educated manpower by the U. S. economy and thus for the output of the education industry. The paper largely discusses the student-teacher input-output relations and the demand for places since the other phases are still under study.

● Scully, Malcolm G.

Graduate-Study Growth Plans Are Challenged

The Chronicle of Higher Education, Volume V, No. 5, 1, 5, October 26, 1970.

This is a general review of the supply-demand picture in graduate education. Due to overproduction of Ph.D.'s and a decrease in Federal support, tighter control over graduate enrollments and programs is urged. The following reasons are given: as Ph.D.'s increase, the need for college teachers will decline, the number of college-age students will decrease, the increase in percentage of high school graduates enrolling in college will slow down, and the replacement rate of teachers will decrease because of more young faculty members available. The two opposing schools of thought are discussed: one seeing overproduction and urging cut backs or limiting production and support to 50-75 "National Universities," and the other urging a holding operation since overreaction could lead to irreversible sharp cut backs when only leveling out in some fields is necessary. Most believe that a full analysis must be made before general reductions are attempted.

● Strassenburg, Arnold A.

Supply and Demand for Physicists

Physics Today, Volume XXIII, 23-28, April, 1970.

The 1969 AIP employment survey, mailed to all Ph.D. recipients in physics during 1967-1969, confirmed that employment is more difficult in a declining job market. The results and conclusions, based on 1,145 usable replies from 1,500 respondents, showed that there were more offers than individuals seeking jobs in 1967, but by 1969 the situation was reversed. Reasons for this were: most employers indicated that physics is suffering from overspecialization in graduate school, rapid obsolescence and competition from engineers who adapt more easily to applied research; the most important single influence was the decrease in Federal support of R & D in physics during 1962-1968 which has now leveled off with no evidence of immediate improvement. The shortage of jobs was not matched by a reduction in the supply of new physicists: the number of Ph.D.'s increased by 40% during 1966-1968; master's remained constant over the last three years; and the bachelor's granted, although recovering from a severe drop four years ago, continued to decline (but they were doing better than Ph.D.'s in the job market). The percentage of Ph.D.'s satisfied with their present jobs was about the same in 1967 (72%) and 1969 (74%), but those seeking employment increased from 29% in 1967 to 35% in 1969.

● Tickton, Sidney G.

Overcoming Manpower Shortages

PNLA Quarterly, Volume XXX, No. 1, 24-35, October, 1965.

Application of the methods used by industry, business, government, and a few professions to libraries to overcome manpower shortages and to extend the existing supply, is proposed. Libraries should concentrate on action programs, not surveys or statistics, such as attracting capable people, especially women, into the profession. Increasing productivity, utilizing in-service training programs, using automated and mechanized techniques, better construction design and space utilization, parlaying seed money to accrete other sources of funds, and marshalling the most qualified people in the community to assist with management and financial problems are recommended.

● Tunnell, Gayle

U. S. Builds a Surplus of Teachers

Washington Post, July 19, 1970.

This article states that for the first time in a quarter of a century the United States is entering a period of teacher surplus. This will last through at least 1975 if the established trends of teacher supply and demand continue, and will affect the quality of teachers and salaries. Geoffrey H. Moore, Commissioner of Labor Statistics, projects the need during 1968-1980 for 2.4 million teaching jobs and a supply of 4.2 million--a supply 3/4's greater than the demand. The reason for this large surplus (55,000 by 1975, according to United States Office of Education estimates) is that the post World War II "Baby Boom" is now graduating from college in large numbers. Although 37% of these graduates are prepared to teach, elementary and secondary school enrollments have leveled off due to the declining birthrate. There are, however, a few fields where the need for teachers still exists: industrial arts, vocational education, remedial reading, and other specialities.

● U. S. Department of Health, Education, and Welfare. Office of Education, by James F. Rogers

Staffing American Colleges and Universities

OE-53028. U. S. Government Printing Office. Washington, D. C. 1967.

Although somewhat outdated by recent developments, this Office of Education study projects the demands for faculty and other professional staff in higher education from November 1963 through October 1969 based on a survey of 1,809 institutions made in 1963. The institutions estimate that they will need 199,138 full-time professional staff, 51,438 for replacements and 147,700 for additions from 1963 to 1969. In the fall of 1969, public institutions expect to be employing 65.2% and private insti-

tutions 34.8% of the total full-time professional staff needed. Other assumptions used in the study and projections have subsequently largely been invalidated by later developments.

PROJECTIONS AND GOALS

● Bogue, Donald J.

The End of the Population Explosion

The Public Interest, No. 7, 11-20, Spring, 1967.

This article has an indirect application to graduate work and deals with the thesis that from 1965 onward the rate of world population growth may be expected to decline until it becomes zero or near zero at about the year 2000. After 2000, population growth will not be regarded as a major social problem except in isolated and small "retarded" areas. Reasons for this are given which are subject to criticism by other authorities with different views.

● Cartter, Allan M., and Robert L. Farrell

Academic Labor Market Projections and the Draft

The Economics and Financing of Higher Education in the United States. A Compendium of Papers Submitted to the Joint Economic Committee, Congress of the United States. U. S. Government Printing Office. Washington, D. C. 357-374. 1969.

Much of the testimony given in this paper re-emphasizes Cartter's thesis that the fears of the 1950's and 1960's concerning a shortage of college teachers and the deterioration of educational quality were erroneous and that we can look forward to the 1970's with confidence that there will be an adequate supply of available manpower to meet most critical needs in teaching, research and other specialized needs. Less than 1/3 of the doctorates granted will be needed to maintain the quality of our staffs in the 1970's and only about 20% in 1985. Less Federal support will be required in the future to stimulate students to enter graduate school; however, more support will be required to meet the rising costs of graduate education, and there is a great need for equitable sharing of the high costs among public and private agencies. Graduate education is truly a national responsibility and the market for students achieving the Ph.D. is a national one. Attention should be directed to utilizing the available talent in meeting the challenging tasks of society and the long-term health and vigor of the system.

● Folger, John K., et al.

Human Resources and Higher Education

Staff Report of the Commission on Human Resources and Advanced Education. Russell Sage Foundation. New York. 1970.

The staff report of the Commission on Human Resources and Advanced Education deals with manpower problems and issues facing the United States. The nation has responded well to expanding our educational system in the postwar period but it is questionable that we have maintained quality in the process. Predictions of manpower needs have been inadequate in the past. If we are to make adequate use of manpower to achieve national objectives, we will have to increase the information we have on our resources and improve the way the information is used. The report deals with the market for college graduates, the predicted shortage of jobs for them, and better recruitment and counseling of the young on careers and shortage of occupations. It discusses surplus graduates by fields and predicts job saturation dates in these fields and professions.

● Froomkin, Joseph N.

Approaches to Forecasting Demand for College Graduates and Ph.D.'s

Paper presented at Association of American Universities symposium, Washington, D. C., April 2, 1971.

Froomkin reviews and analyzes papers distributed to participants at the AAU sponsored Symposium on Supply-Demand Relationships of Ph.D.'s and draws his own conclusions as to the projections and factors affecting the overall supply and demand situation. In agreement with the Bureau of Labor Statistics and the NSF projections of a relative balance between seekers and job opportunities, he finds it difficult to accept forecasts of serious shortages or surpluses, except for certain occupations such as medicine. In the long run, the author believes that the supply of Ph.D.'s will be constrained mainly by the availability of funds for graduate education and, in the case of the sciences, by the funds for research and development available to support Ph.D. candidates' research. He is less alarmed about the near future than what is likely to face us in the 1980's and beyond, and recommends a modeling of Ph.D. flows in all sectors and a careful examination of opportunities for them.

● Hall, Wayne C.

The Graduate Marketplace: Current Status and Future Projections

Proceedings Twelfth Annual Meeting. Western Association of Graduate Schools. Seattle. 85-103. March, 1970.

The data base and factors controlling the past growth of graduate education are reviewed as a foundation for assessing the current status and future projections: the number of doctorate-granting institutions has doubled every 20 years since 1945 to 227 in 1968; the number of full-time graduate students has doubled about every ten years, is expected to triple in the 1969-70 period, and should reach about 1.4 million by 1980; and the number of doctorates granted since 1940 has tripled, about 30,000 are forecast for 1970 and 60,000 or more are likely to be granted in 1980. Thus, adequate capacity exists for producing maximum numbers of highly trained manpower, but storm signals appearing about 1968 indicate that careful planning for the future is necessary--the nature of graduate education and its support are rapidly undergoing change and more changes are destined to come. Evidence suggests that most Ph.D.'s found jobs in fields relevant to their training in 1968-69 and more moved from basic research into teaching, that further retrenchment in employment opportunities is imminent in 1970-71, and that this trend will continue unless doctorates are deployed into other areas. If graduate programs are not reorganized to meet other interests, there will be serious trouble ahead, plus much bitterness and frustration on the part of new Ph.D.'s. It is recommended that careful studies should be made by national and individual professional groups by disciplines in order to provide timely and up-to-date information, and that support of adequate financing of quality graduate education should continue.

● Lecht, Leonard A.

Goals, Priorities, and Dollars: The Next Decade

The Free Press. New York. 1966.

A compendium of 16 national goals that resulted from the work of the National Commission on American Goals and Resources, appointed by President Eisenhower partly as a result of the Russian space achievement, are discussed. The goals, presented in 16 chapters, are: consumer expenditures and savings, private plant and equipment, urban development, social welfare, health, education, transportation, national defense, international aid, space, agriculture, manpower retraining and area redevelopment. Large increases in expenditures can be expected to achieve most goals in the 1970's but the potential growth in the GNP will set practical limits to the pursuit of these goals. A more vigorous pursuit of our objectives would raise the actual rate of GNP growth to a closer approximation to its potential. Priorities in goals must be established because all cannot be fully realized. The study includes projections to 1975 of GNP, population, personal family income, and expenditures for education, as well as comments on these projections.

● Martino, Joseph P.

Science and Society in Equilibrium

Science, Volume CLXV, 769-772, August 22, 1969.

The growth of science over the last several decades in terms of the growth of society as a whole and the Gross National Product (GNP) is critically analyzed and model projections are made to 1975 assuming different cases for possible growth. Severely criticized as invalid are earlier projections based on the premises that students will continue to enroll in science and engineering at former rates, and that the demand for manpower will be projections of past rates. The author concludes that science staffs in United States universities already are larger than the staffs required in 1975 if science came to equilibrium with society in 1968. His conclusion is based on computations denying the validity of past input projections and that future demand will be limited to numbers required to maintain equilibrium growth of science, growth of resources, and population growth. He further concludes that the R & D employment requirement by 1975 and 1976 will be drastically less than the numbers of scientists available in those years. If science comes to equilibrium with society, many of the present customs, practices and habits will have to be modified considerably, and these changes will have drastic and traumatic effects on universities.

UNEMPLOYMENT/UNDEREMPLOYMENT/UTILIZATION

● Astin, Helen S.

Factors Associated with the Participation of Women Doctorates in the Labor Force

The Personnel and Guidance Journal, Volume XLVI, No. 3, 240-246, November, 1967.

This study was undertaken to investigate the employment status and career commitment of women doctorates based on a sample of all women doctorates granted in 1957 and 1958. A wide range of questions was asked in the survey with the primary interest to identify the personal and environmental factors that are associated with the participation of women doctorates in the labor force. Important findings were: 91% of the sample are in the labor force and 81% are working full time; married women participate less fully than single women; the greatest loss is in the natural sciences contrasted to the higher rate of full-time employment in the humanities and education; women who hold assistantships are more motivated, more energetic and are more likely to be in full-time employment. Overall, working women have increased from 20% of the working force in 1920 to 32% in 1962; married women have increased from 23% of total women working in 1920 to 60% of women working in 1962; motivation, not just necessity, is an important factor in working; and the proportion of unemployed women decreases with increasing education.

● Astin, Helen S.

The Woman Doctorate in America

Russell Sage Foundation. New York. 1969.

The specific goal of this study was to determine how the talents of highly trained women are utilized. Using NAS-NRC Office of Scientific Personnel's "Survey of Earned Doctorates" for 1957 to 1958, questionnaires were sent to 1,958 women doctorates. The seven-year gap between when the degree was earned and when the study was begun allowed for the establishment of careers. The study found that 85% of the women doctorates in the United States were American born to highly successful parents. Only 55% were married, and of those married most had two children. On the whole, these women were extremely committed. Even the short career interruptions of the married woman are not true withdrawals from her specific field and they do not necessarily represent a talent loss. Another finding reported by Astin was that the women Ph.D.'s career choice depends on cultural background, mother's employment and other factors. The forms of discrimination most often experienced by women were lower salaries and differential treatment with regard to promotions, tenure and seniority.

● Barnes, Andrew

Doctorates Are No 'Open Sesame' to Jobs This Year, Many Learn

The Washington Post, December 29, 1970.

This June's Ph.D.'s (1971) are having extreme difficulty in finding jobs; often there are three times as many applicants as there are positions available.

● Boffey, Philip M.

Unemployment: What Nixon Is/Isn't Doing to Help Jobless Scientists

Science, Volume CLXXI, No. 3975, 985-987, March 12, 1971.

This is a report on an Administration conference held to discuss plans for alleviating the unemployment crisis in the aerospace and defense industries. The conference was chaired by Edward E. Davis, Jr., President Nixon's Science Advisor. One of the key points is that the present Administration does not intend to provide emergency "handouts." Instead, the government's efforts will center on trying to provide placement and retraining services, additional funds for R & D for FY 1972, and the formation of clearing houses by professional societies and the Department of Labor to match jobs with applicants.

● Cartter, Allan M.

Scientific Manpower for 1970-1985: The Oversupply of Ph.D.'s Will Seriously Affect Higher Education and National Science Policy.

Science, Volume CLXXII, No. 3979, 132-140, April 9, 1971.

Cartter updates and refines his previous projections of an oversupply of Ph.D.'s in the 1970-1985 period and the serious impact this will have on higher education and national science policy unless remedial steps are taken. Even without the present budgetary and Administrative restraints we would still have experienced and abundance of doctoral scientists in most fields now and it would become more marked later in the decade because of a graduate system geared to producing from 30 to 50% more Ph.D.'s than can effectively be used in the decade ahead. The author foresees that in the coming decade only about one doctorate in four will find suitable academic employment and by 1980 it could become less than one in ten; nonacademic employment demands are not likely to absorb the excess, but it is unlikely that any substantial number of doctorates will be unemployed--only underemployed despite the surplus conditions forecast. Several recommendations are suggested to alleviate the potential problems: formulation of a rational and effective national policy for support of graduate education, changes in tenure and retirement systems in universities, more rigorous control and assessment of graduate education at all levels, and appointment of commissions by professional organizations to study manpower problems and needs by disciplines coordinated by a national group.

● Chemical and Engineering News

Job Outlook: Dim and Growing Dimmer

Chemical and Engineering News, Volume XLVIII, No. 30, 22-26, July 20, 1970.

As a sequel to their November, 1969 report, Chemical and Engineering News reviews the job market outlook for chemists and chemical engineers. It is concluded that authoritative statistics are lacking, but based on discussions and opinions of people concerned with employment and the supply/demand picture, the outlook is pessimistic. The job market has tightened and unemployment is increasing, particularly at the Ph.D. level and on the coasts; the Engineer/Scientists Demand Index figure fell to a ten-year low in April 1970 and recruiting by industry was off 20%. Job offers, according to College Placement Council, to Ph.D. chemists and chemical engineers dropped 58% and 53% this year, and at the master's level 30% and 11%.

- Higher Education and National Affairs

  Placement Council Survey Finds Employment Picture Dim for 1971's Graduates

  Higher Education and National Affairs, Volume XX, No. 3, 3-4, January 22, 1971.

  The CPS survey of job prospects confined its data base to industrial, government and business employers in engineering, science-mathematics, other technical, business, and other nontechnical disciplines; all degree levels were represented. Results were: 21% fewer campus recruiting visits will be made by 916 employers and 23% fewer graduates will be hired than in 1970; 19% fewer interviews were scheduled at 521 colleges and universities during their first semester. The reductions reported at all three degree levels by the 916 employers were: bachelor--drop of 24%; master--decline of 22%; and doctorate--drop of 43%.

- National Research Council. Office of Scientific Personnel

  Employment Status of Recent Recipients of the Doctorate

  Science, Volume CLXVIII, No. 3934, 930-939, May 22, 1970.

  The NRC conducted two national surveys to assess the employment status of Ph.D. recipients for the academic years 1967-68 and 1968-69 in view of the recent increase in output of new Ph.D.'s of about 12%/year and reports of dwindling employment opportunities. The first survey involved 4,406 chairmen of academic doctoral departments of natural and social sciences, engineering and mathematics; over half of the chairmen responded, representing 79% of the Ph.D.'s granted during the two years. The second study was based on data collected from the Annual Surveys of Earned Doctorates conducted in cooperation with the graduate deans and the recipients of research doctorates in all fields in which the typical response rate ranged from 95 to 98%. The evidence from the two surveys indicates that virtually all recipients of the doctorate in the sciences and engineering during the two years found employment in a constricted job market and does not support the notion of widespread unemployment or mal-utilization of training and talents. Overall data from the departmental chairmen indicate 0.7% unemployed and 0.4% mal-employed in 1968 and 1.1% unemployed and 0.7% mal-employed in 1969. Data from the Doctorate Records File in general showed little difference in the situation in 1969 from that existing five years earlier; although there was a tightening of the job market and a movement of Ph.D.'s into teaching positions in increasing numbers, there was little evidence of appreciable unemployment among the Ph.D.'s surveyed.

- National Science Foundation. Office of Economic and Manpower Studies

  American Science Manpower 1971

  To be Published. National Science Foundation. Washington, D. C.

  This survey indicates that of the more than 300,000 scientists in the country, the number unemployed and seeking employment rose to 4,900 (1.6%) in 1970, from 2,800 (0.9%) in 1968. By degree levels, the proportions unemployed were: 2.4% for master's degree holders, 1.7% for those with baccalaureates, and 0.9% for those with doctorates. By fields, the largest proportions unemployed were in sociology (3.3%), political science (2.8%), and physics (2.2%); the smallest was in psychology (1.0%).

- Shapley, Deborah

  Job Prospects: Science Graduates Face Worst Year in Two Decades

  Science, Volume CLXXII, No. 3985, 823-824, May 21, 1971.

  This review of employment possibilities paints a gloomy outlook for 1971 and the immediate future. Compared with the current overall national unemployment of 6.1%, two of the groups most affected--physics (4%) and chemistry (2.7%)--report better figures on unemployment. These statistics do not include those holding part-time jobs, temporary jobs or subprofessional jobs and the predictions of future oversupply indicate that this June's crunch is just a foretaste of the surplus problem apt to accentuate during the 1970's. Lee Grodzins, who chaired a winter study for the Economic Concerns Committee of AIP, predicts an increase in the unemployment of physicists by this summer of 6% to 7%. The ACS survey, which reached about 1/4 of the nation's chemists and chemical engineers, reports 1.2% of the respondents temporarily employed, 1.0% employed part time, and 2.4% subprofessionally employed; when added to the 2.7% unemployment figure, a total of 7.3% of all chemists are in either underemployment or fluctuating job situations. The American Geological Institute's survey of 1971 graduates indicates that 90% or more of the departments felt 1971 was as bad or worse than 1970 for employment of earth scientists, although the surveys have projected a fairly stable supply and demand situation; offering salaries for Ph.D.'s in 1971 were much lower than in 1970. Several trends and factors indicate selectivity in hiring and a dismal future: increasing preference of industrial employers for B.S.'s over Ph.D.'s, increasing importance of the quality of the candidate, increasing competition of senior employees, increasing production of Ph.D.'s, little hope that the national economy will soon improve, and a decline in educational employment.

C O S T S A N D F I N A N C I N G

CHANGING FEDERAL SUPPORT POLICIES

● American Council on Education

The Federal Investment in Higher Education: The Need for a Sustained Commitment

American Council on Education. Washington, D. C. 1967.

The partnership that has developed between higher education and the Federal government forms the basis of ACE presenting its views on action that should be taken by the Federal government to help strengthen higher education so that it can meet the demands the nation is placing upon it. Nine areas of action are developed with estimated funding requirements: academic facilities--$3 billion annually; matching requirement--flexible policy with maximum raised to 75% for all types of facilities under HEFA; emphasis upon expansion; housing and related facilities of approximately $1.5 billion/year; student aid in various forms and categories; cost-sharing and matching requirements; health programs stably supported for teaching, research, and service; government research policy--both project and institutional grants; and general institutional support with quality control for funding.

● Babbidge, Homer D., Jr.

Governmental Policy and Graduate Education

Support of Graduate Education in an Enlightened Society. Cornell University. Ithaca, New York. 5-16. 1960.

Babbidge describes the changing policies of the Federal government's efforts to make the heavy financial support it has given graduate education since World War II more effective, meaningful, and constructive. Two basic policy questions to be resolved are: whether support should be designed for all students or for only the best few, and the issue of categorical vs. general support designed to achieve long term or short term goals of the Nation on an equitable basis. These issues probably will not be resolved until 1970, but wisdom lies in resolving the issue toward the many and the general.

● Haworth, Leland J.

Some Problems and Trends in the Support of Academic Science

Science, Government, and the Universities. University of Washington Press. Seattle. 42-60. 1966.

The topics reviewed are the motives for Federal support, how they have changed, and the role of the National Science Foundation in relation to the scientific community. Present and future programs, especially for the development of institutions, are discussed. Past motives for support are: meeting national goals in defense, health, etc.; basic research, mostly at universities; science education to provide manpower for basic work; and sharing support with different regions of the country, so all would benefit. The effects of Federal support of science are: the expectation of science to prosper as scholarship improves, the university system will be strengthened as greater care is taken in the distribution of support, and the support of science for its own sake will increase. The role of NSF in the scientific community has been to support research and education for the dual purpose of promoting scientific productivity and increasing intellectual development, and to foster and shelter the image of science as a worthwhile activity. Present and future program needs are: criteria for selecting supportive work remaining unchanged, ability remaining sole criteria for fellowship selection, and enlarging institutions where knowledge will be pursued.

● Johnson, Lyndon B.

Strengthening Academic Capability for Science Throughout the Nation

Science, Government, and the Universities. University of Washington Press. Seattle. 109-116. 1966.

In his memorandum to heads of departments and agencies, President Johnson discusses the function of various governmental agencies with suggested actions in regard to Federal support of universities through grants and contracts. It includes statistics as to past and current support, recommended roles of the agencies, and with the main thesis of the basic policy to insure that Federal support not only fosters specific results but strengthens academic institutions on a broader base and with long-term goals in mind.

● Kidd, Charles V.

Developments in Federal Support of Graduate Education

Paper presented at the Third Annual Summer Workshop for Graduate Deans, Council of Graduate Schools in the United States, Brainerd, Minnesota, August 16-21, 1970.

Kidd reviews the Federal support of graduate education during the last decade which is in sharp contrast to current trends and policies. In retrospect, he concludes it was a golden decade of rapid expansion, but the expansion

was too rapid; he argues the advantages of moderate, sustained growth of about 10%/year in contrast to sharp increases followed by sharp decreases, as are now imminent. The mission and role of the Federal government in graduate education and how these might be implemented are discussed in light of the tight budgetary outlook ahead. Graduate education will receive critical examination in the years ahead in terms of inputs and outputs and especially with regard to benefits to the nation. The future indications for graduate education are suggested and analyzed; an even rate of increase in support, about 5%/year, is recommended as one of several recommendations--but the outlook for adoption of these recommendations is not bright.

● Lear, John

Science/The Endless Search

Saturday Review, Volume LIII, 59, May 23, 1970.

The effects of huge cutbacks in Federal funds for research and development, particularly the impact of the Mansfield Amendment on the Department of Defense and agency cutbacks at HEW, AEC, and NASA, are discussed. One consequence of decreased funding, although the National Science Foundation's budget overall will increase considerably, will be a 50% decline in the number of first-year graduate Federal fellowships and traineeships. AIP Survey of job opportunities in physics indicates, that although first choice jobs are rare, recent Ph.D.'s are finding employment. Broader graduate training, not necessarily leading to a doctorate, is recommended to meet the needs of national problems.

● McNett, Ian E., and Robert L. Jacobson

U. S. College Funds: 1970 Budget; 1976 Proposal

The Chronicle of Higher Education, Volume III, No. 10, 1, 2, 4, January 27, 1969.

The authors review both the 1970 budget and the 1976 proposal (the latter being based on the Rivlin Report). In the first review, the 1970 budget is compared to the 1968 (actual) and the 1969 (estimated) figures by agencies and programs--the Johnson Administration bequeathed the Nixon Administration a proposed $5 billion higher education budget for fiscal year 1970 which involved new investments in students, colleges, and other unresolved problems. The 1976 proposal is a sweeping plan, resulting from the Advisory Committee's Report to the President, calling for appropriations of about $5 billion in 1970 and rising to $14.7 billion by 1976.

● National Science Foundation. Office of Economic and Manpower Studies

Impact of Changes in Federal Science Funding Patterns on Academic Institutions

Science Resources Studies Highlights. NSF 70-39. National Science Foundation. Washington, D. C. October 15, 1970.

The article reports the results of two studies made by NSF in 1969 and 1970 with emphasis on the impact changes in Federal funding have made on 86 doctorate granting institutions. Both surveys show a declining rate of growth in nearly 700 departments in both research and science education and also, that Federal funding has not kept pace with general enrollment and cost increases. Those factors have resulted in reduced operations in many areas--particularly for the physical sciences, followed by the life sciences. The future impact of present policies on morale and national needs is stressed with the conclusion that conditions will get worse unless relieved.

● Rivlin, Alice M.

The Role of the Federal Government in Financing Higher Education

Brookings Institution. Washington, D. C. 1961.

This is a general review of the history and role of the Federal government in financing higher education beginning with Federal support of the land-grant colleges and agricultural research, followed by the support of health and military research before World War II, the great impact of support during and following World War II, to the present situation (viewed as a crisis in 1960-61). She documents her premise of a crisis by citing the usual statistics of future enrollment pressures, increasing demands for higher education, increasing costs and the plight of the private sector. Fundamental questions about the future role of the Federal government in financing higher education are discussed with the conclusion that the Federal government will have to bear an increasing proportion of the financial burden in the coming decade because higher education is a national resource and because of the necessity to equalize opportunity. The forms that this aid should take--direct aid to institutions, direct aid to students, and other alternatives--are weighed, with the author favoring direct aid to institutions but not at the expense of existing programs of Federal support of research or aid for construction.

● Russell, John Dale

Dollars and Cents: Some Hard Facts

Higher Education: Some Newer Developments. Samuel Baskin, editor. McGraw-Hill Book Company. New York. 273-303. 1965.

It is estimated that educational expenditures will rise 170% to $9.8 billion by 1969-70. Financial requirements indicate that present sources will have to be

tapped to the utmost, economies will have to be effected and new sources of funds discovered to meet current and future needs. Four factors affect the financial situation: rapidly rising enrollments; high cost of research--both current and needed expansion; increase in faculty salaries required and strengthening of the quality of institutional programs needed; and demands to expand graduate and professional education, expensive to maintain and to increase, are accelerating. The need for capital funds is critical. Most observers conclude that the Federal government is the only source that can provide quickly enough the large sums needed for support in the immediate future.

● Wolk, Ronald A.

Alternative Methods of Federal Funding for Higher Education

Carnegie Commission on the Future of Higher Education. Berkeley. 1968.

The ways in which Federal funds should be provided is debated vigorously. Kerr states in the preface that the way the Federal government provides funds is as important as the money itself, for this bears directly on the distribution of power and money. Five major alternative ways in which Federal funding should be provided are listed and discussed: categorical aid (historically the principal method), aid to students, grants to institutions, tax relief, and revenue sharing. Each method has its advocates and bills for most of these forms have been introduced in Congress. Today about 24% of higher education's expenditures comes from Federal sources and general conviction is that this percentage must increase; USOE predicts that by 1975-76 higher education will be spending about $11 billion (in today's dollars) and the Federal share will increase to about 34%. It is concluded that, although Federal aid to institutions has risen from $775 million in 1958 to $5 billion in 1968, it will have to double in the next decade; also, the nature of support will shift to strengthening of institutions in general since the improvement of higher education is a national goal in its own right.

● York, Carl M.

The Outlook for Federal Support of Scientific Research and Development

Paper presented at the Fall Meeting of the American Physical Society, New Orleans, Louisiana, November 23, 1970.

Carl York of the Office of Science and Technology discusses the future prospects of Federal funding for science. The decrease in funds spent on research by DoD, NASA, and AEC reflects the change in concerns of the country and the economic depression. Lee DuBridge suggests that the overall Federal funding available to institutions could be stabilized by having a stationary increase of 6% per year (5% for inflation and 1% as minimum growth rate) even though it will not be possible to stabilize funding in any given field of science. The current oversupply of Ph.D.'s is regarded as a temporary phenomenon caused by the cuts in defense and space spending. It appears that there will not be a major expansion of the funding of the physical sciences by the Federal government for the foreseeable future.

FORMULAE, MODELS, TOTAL AND UNIT COSTS

● Breneman, David W.

An Economic Theory of Ph.D. Production: The Case at Berkeley

Research Program in University Administration, Ford Foundation Grant #68-267. Office of the Vice President--Planning and Analysis, University of California. Berkeley. June, 1970.

The author proposes a model of departmental behavior in which academic departments attempt basically to maximize prestige, defined as control over resources and placement of graduates in institutions of comparable or higher quality. From this behavioral assumption, Breneman derives a number of predictions concerning admissions, curricula, information, financial support, and other characteristics of academic departments at Berkeley on the basis of which he was able to predict with some success varying progress and success rates for graduate students in different departments. He concludes that the result of the budgetary process is that departments are rewarded for maximizing input with no reference to the output of the process and suggests that a more reasonable approach would be to focus upon the output of the university and examine the factors that influence the production of that output; further that Berkeley, by defining degrees (Ph.D.'s) as the output measure, concentrates the university's role on certification as opposed to education.

● Cartter, Allan M.

The Economics of Higher Education

Contemporary Economic Issues. Neil W. Chamberlain, editor. Richard D. Irwin, Inc. Homewood, Illinois. 1969.

Cartter treats in some detail the economic background, the parameters and problems that determine the costs and benefits of higher education to the extent that education is investment rather than consumption, that public funds are used directly or indirectly to subsidize students or institutions, and that manpower planning and budgeting is of particular interest. The reasons why past predictions have proved to be erroneous are discussed, with Cartter seeing 1970 as the pivot when supply and demand relationships begin to change dramatically. Three measures of efficiency are presented and overall conclusions governing the problems of choice and allocation of scarce resources are made and discussed.

● Cartter, Allan M.

Reflections on the Cost of Graduate Education

Informal memorandum to participants in the Conference on Predoctoral Education in the United States, Woods Hole, Massachusetts, August 24-27, 1969.

This informal paper and estimates resulted from the discussion and consensus of the participants at the Woods Hole Conference in August of 1969 that there was an urgent need for better data on the costs of graduate education. Cartter's estimates are offered as preliminary, partially documented figures, derived and updated from the 1964 American Council on Education study, Butter's 1965 study and the 1954-55 California and Western Conference Study. The total cost of graduate study is considered as the product of total institutional cost (direct instructional costs combined with indirect operating costs and annual capital cost) and externally financed research costs. These costs as the averages of three broad areas are given as the average cost per student per year in graduate school: $4,885--humanities, $6,360--social sciences, and $18,800--sciences. The total cost of producing one successful Ph.D. is about 4.5 times these figures; to allow for attrition the figures must be multiplied by a factor of seven to estimate the total investment by the system. For example, this figure is about $62,000 in the sciences. To derive more reliable total cost figures until data from a more detailed study are available, Cartter recommends using his approach and instructional cost data by department from 15-20 representative graduate schools for the most recent year available, better estimates of indirect costs by field of study, and more reliable estimates of capital costs and alternative costs of federally financed research of which Ph.D. output is a joint product.

● Farrell, Robert L., and Charles J. Andersen

General Federal Support for Higher Education: An Analysis of Five Formulas

Working Papers for the Commission on Federal Relations. American Council on Education. Washington, D. C. August, 1968.

This paper discusses five major formulas (The Miller Bill, Bowen Proposal, Modified New York State Plan, Basic Enrollment Formula, and the Growth Difference Formula) proposed to be used for the distribution of general Federal support grants to higher education. The costs and simplicity of apportioning the various plans and how much they will provide the institutions are estimated. Analysis by sector, applying any of the five formulas, does not reveal what happens to individual institutions and the fact remains that some institutions would benefit more than others under any formula approach. Once the inequities are accepted, universities should develop a consensus on a single approach for general support to strengthen all of the higher education enterprise.

● Firmin, Peter A., et al.

University Cost Structure and Behavior

Final Report National Science Foundation Contract C451. Graduate School of Business Administration and Department of Economics, Tulane University. New Orleans, Louisiana. August 31, 1967.

This study and report was conducted and prepared by faculty members at Tulane under NSF sponsorship with the objective of obtaining better management in higher education. Before constructing a cost model, over 100 institutions were visited to identify their goals and objectives, important cost and revenue elements, characteristics of university operations, cost behavior at various levels of aggregation of university functions, and to examine the relationship of goals to the behavior of costs. It concluded initially that the diversity of practices in collecting data renders invalid any interinstitutional comparisons of the information currently available. A model was constructed to simulate the costs behavior, based on a sevenfold conception of university functions believed to be common to most, following a functional classification: teaching, administration, research, professional activities, community service, supporting activities, student activities, and other. Significant conclusions made were: enrollment is the best available predictor, and most significant statistically, of the aggregate level of university costs--in total and by major cost components; salaries are the most important of all elements of university costs and these vary with enrollment and with discipline; university policy toward research and secretarial assistance is the most important single determinant of the level of "Supplies and Expense"; budgetary control has an important subjective influence on cost and organization structure plays an important part in cost determination--highly centralized administrations allocate more resources to this function; and university accounting practices and policies determine the structure of cost reports, particularly for overhead allocation and auxiliary services.

● Hamelman, Paul W.

Planning and Analysis for Higher Education: Promises and Pitfalls

Paper presented at the Joint National Meeting of the Operations Research Society of America/American Astronautical Society, Planning Challenges of the 70's in Space and the Public Domain, June 20, 1969. (Mimeographed.)

Hamelman's paper is a general presentation of the application of operations research, systems analysis, PPB, and related concepts to educational planning; West Virginia institutions were used as examples of the process. The production function concept of higher education may be generalized and applied to institutions large and small, centrally-planned or loosely-knit, despite differences in goals and philosophies. Successive levels of planning and decision making were defined from his research which attempts to link the activities of a single university to the public system of which it is a part. The author discussed

the various dimensions used for unit cost analyses (e.g., cost per student, cost per student class hour, cost per student credit hour) and the various determinants of instructional costs. An illustration offered for an approach to such unit cost analyses is: production of "products" (students) by "sectors" (academic departments) of the "economy" (college or university) which engender resource requirements (space, equipment, faculty, etc.) in both the expanding sector of the economy plus its suppliers. Pitfalls of using PPB--advantages and disadvantages--are discussed.

● Peters, Max S.

Ratios and Factors for Teaching and Space Requirements for Quality Engineering Education

Paper presented at the 78th Annual Meeting of the American Society for Engineering Education, Columbus, Ohio, June 23, 1970.

This paper discusses proposed numerical values of ratios and factors relative to costs and needs for teaching and space to provide quality engineering education. The factors include student-faculty ratios, teaching assistants, secretarial and technician assistance, computer costs, library facilities, supplies and expense budget, special faculty support and equipment expenses. The key importance of selected and special ratios for engineering is emphasized along with the desirability of considering the engineering budget separately from other components of a university. A national engineering study by the Engineering College Administrative Council is urged to provide recommended ratios for engineering with the prestige and backing of a national organization.

● Siegel, Barry N.

Costing Students in Higher Education: A Case Study

A Progress Report. Center for Advanced Study of Educational Administration, University of Oregon. Eugene, Oregon. August, 1967. (Mimeographed.)

This is a progress report of a pilot study in higher education, allocating only direct instructional costs for the fall terms of 1964 and 1966 at the University of Oregon, among various broad disciplinary areas at different levels. It is thc first step in building a set of social accounts for higher education in Oregon which could be used as a managerial tool to determine current costs and allocations and to forecast future needs and legislative requests. The costs reported are on a gross, rather than a net, basis and refer only to direct faculty instructional costs. The results indicate the average cost/course rises with the level of student, regardless of student type. Costs are given by broad area and level; graduate students are not as expensive as usually portrayed. It recommended that future studies and systems include all costs and estimate the dollar value of these costs.

● Stewart, Clifford T., and John W. Hartley

Financial Aspects of Interinstitutional Cooperation: Unit Costs in Cluster and Non-Cluster Colleges

The Claremont Colleges. Claremont, California. June, 1968.

The Claremont Colleges were compared to 18 selected colleges, and to Dartmouth for overall comparison, in a study of costs and savings by use of centralized arrangement and operation of the library, business office, health services, institutional research, telephone, and maintenance. Results showed that there are advantages in central operation of the library, business office, and health services both from the viewpoint of increased economies and increased services (quantity and variety). For the other areas there was not sufficient information to determine any advantages of central versus individual operation.

● University of Illinois

Supportive Study IV, Selected Resources Applied by a Department to Generate a Student Credit Hour 1967-68

Ten Year Plan Supporting Analytical Studies. Associate Provost and Director of Institutional Studies, University of Illinois. Urbana-Champaign, Illinois. August, 1969.

This report, as one of the supportive studies conducted by the University of Illinois in their ten-year plan, deals with the estimated costs of instruction for 24 broad areas for 1967-68. The systems approach used attempts to relate students to staff, space, and dollars in one comprehensive report. Assumptions made in preparing the analysis were: the total number of semester credit hours taught by a department is a valid index of departmental performance, the costs of instruction reflect both state and restricted funds to show full expenditures, organized research as it supports instruction is included, and special allocations and combinations of departments are used as shown in "Selected Resources Study" for Urbana. Costs are given by student level and by unit costs by level; at the graduate level both master's (Grad 1) and doctoral (Grad 2) data are derived. The average for all departments was $144.60/student credit hour for master's and $471.25/student credit hour for doctoral students. Average figures for individual fields are given and representative costs per year per student show a wide range from slightly less than $4,000 to over $60,000; the average for the university as a whole indicate master's at $4,338 and doctorates at $14,138.

SALARIES, FACULTY AND OTHERS

● Jacobson, Robert L.

Cost of Living Outpaces Rise in Faculty Pay

The Chronicle of Higher Education, Volume V, No. 28, 1, 5, April 19, 1971.

This article summarizes the report of the 1970-71 survey by the AAUP on faculty compensation. After analyzing results of the latest annual survey of colleges and universities, the Association's Committee Z reported that faculty salaries have risen on an average of 5.4% since 1969-70 as compared to an increase of nearly 6% in the Consumer Price Index. Even with fringe benefits, the increase in overall faculty compensation came to only 0.2% more than the percentage rise in living costs. The survey covered 271,585 full-time faculty members at 1,345 reporting institutions; compensation for these averaged $14,707/9 months, including average salaries of $13,233 and average fringe benefits of $1,474. The committee report, entitled "At the Brink," warned that the prospects of college teachers improving their economic situation were dismal and of possibilities for a disastrous decade ahead. Excluding medical schools, only 17 institutions reported average compensation above $20,000 for full-time faculty. By ranks, the average compensations were: full professors--$20,398; associate professors--$15,330; assistant professors--$12,647; instructors--$10,086; and lecturers--$12,669.

● Roethel, David A. H.

Starting Salaries--1970

Chemical and Engineering News, Volume XLVIII, No. 49, 46-51, November 23, 1970.

This 1970 survey done under the auspices of the American Chemical Society reports a record low in year-to-year salary gain of only 1.6% for chemists and chemical engineers. Most 1970 graduates barely matched 1969 starting salaries and some, especially women, reported 1970 salaries lower than in 1969. Overall the unemployment rate for chemists was 5.1% and for chemical engineers 3.4%; Ph.D.'s were 3.1% and 1.7% respectively. Details of salaries within special sub-fields are provided.

● Tickton, Sidney G.

Teaching Salaries Then and Now--A Second Look

The Fund for the Advancement of Education. New York. 1961.

This report updates the statistical tables in the booklet, "Teaching Salaries Then and Now, A 50-Year Comparison With Other Occupations and Industries." It is a historical comparison (statistics obtained from the U. S. Office of Education, the U. S. Department of Labor, and a number of professional societies)

from 1904-1959 between teaching salaries and the salaries in other occupations, e.g., railroad workers, telephone operators, workers in industry, physicians and dentists. Data on average annual salaries and relative purchasing power by types of position and rank are given.

● Walsh, John

Faculty Salaries: 1969-70 Year May Have Ended an Era for Academe

Science, Volume CLXX, No. 3955, 306-308, October 16, 1970.

This is a review and discussion of the "AAUP Annual Survey of the Economic Status of the Profession" plus other information and comments about faculty salaries and compensation now and in the future. The 1969-70 academic year marks the transition from a previous favorable decade for faculty pay and institutional autonomy; increases in faculty pay last year on the average barely outpaced the rise in living costs--the average nine month salary plus benefits for all ranks and institutions was 7.1% while the rise in consumer price index was 5.4% or a real purchasing power of less than 2%. The factors contributing to this change are discussed. It concludes that faculty discontent increases the possibility that academics will turn more and more to unionization and collective bargaining; the trend to uniformity of salaries will tend to restrict mobility of faculty, and public institutions will be faced with the economic problems formerly associated mainly with the private institutions.

SUPPORT AND FUNDING

Federal Programs, R & D, Standardization

● American Council on Education

Federal Programs for Higher Education: Needed Next Steps

American Council on Education. Washington, D. C. 1969.

This is the American Council on Education's recommendations for Federal programs for higher education in 1969 and concerns essentially all major areas. Specifically in regard to research and graduate education it is concluded that the most fruitful investment of public funds is in support of graduate education and research, a greater investment is needed in social sciences and humanities, NSF and NIH should be continued and increased, and "cost of education" allowance should coincide with cost of living.

- American Council on Education. Commission on Federal Relations

  Funding Needs for Existing Programs

  American Council on Education. Washington, D. C. 1968. (Mimeographed.)

  This report from the American Council on Education states that the requests for funds made under Title I (Undergraduate Facilities Grants), Title II (Graduate Facilities Grants), Title III (Facilities Loans), National Defense Student Loans, the Work-Study Program, the Educational Opportunity Grants, and the National Defense Education Act Fellowships, far exceed the actual funds available to the Office of Education.

- Committee on Physics and Society

  Effects of Trends in the Support of Physics at Universities: Summary Report of a Second Survey

  Publication R-215. American Institute of Physics. New York. March, 1969.

  This summary report of a second survey gives data on the effects of cuts in Federal support of research; actual data are presented for 1965-69 and projected data for 1968-70. Departments and staff members are affected by the cuts, both in numbers and percentage, as well as growth measured in a number of ways; other parameters were also affected.

- Comptroller General of the United States

  Need for Government-Wide Standardization of Allowances Under Federal Fellowship and Traineeship Grant Programs

  Report to the Congress. B-163713. May 24, 1968.

  This review is primarily concerned with the amounts paid for stipends, dependency allowances and travel allowances for the five Federal agencies that account for the majority of all fellowships and traineeships awarded. Estimates for Fiscal Year 1967 indicated that the five agencies supported about 62,500 recipients at a cost of about $422 million. There was no adequate justification for the considerable variances in the amounts allowed: predoctoral student stipends ranged from $1,800 to $2,700 for 12 months for first-year recipients, and other allowances varied widely depending on the bases and criteria used. The report recommended government-wide standardization to equalize programs, to minimize competition for the most qualified students, to simplify administration, and to reduce overhead expenses. In general the agencies reviewed agreed to the recommendations made.

● Johnson, Walter, and Francis J. Colligan

The Fulbright Program: A History

The University of Chicago Press. Chicago. 1965.

The historical origin, genesis, and evolution up to 1965 of the Fulbright Program are traced, described, and discussed: from amendment of the Surplus Property Act of 1944 by the Fulbright Bill, the signing of the Fulbright Act in 1946 by President Truman, to subsequent amendments and changes. The expansion of the program to include 55,681 beneficiaries between 1949-1962 in 48 countries as of 1964 is reviewed. Since "Fulbright" has become synonymous with education and cultural exchanges as a means of furthering international good will and understanding, recommendations are made for the future to involve scholars and their institutions in the planning as well as in the execution of projects.

● Morse, John F.

Washington and Higher Education: Where Are We?

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 17-24. July, 1969.

This is a history and review of the various Federal Acts which have been passed to fund higher education, an assessment of their effects, and a plan for future legislation. The author feels that although the hodgepodge of government activities in education really is not a national plan, the present legislation on the books is sufficient to do the job if certain authorizing legislation were sufficiently funded. However, the possibilities of enough funds for education is not likely with the present defense budget. Morse endorses "excellence" grants and institutional unrestricted grants based on enrollment.

● National Research Council. Advisory Committee on Governmental Programs in the Behavioral Sciences

The Behavioral Sciences and the Federal Government

Publication 1680. National Academy of Sciences. Washington, D. C. 1968.

NAS-NRC established the Advisory Committee in late 1965, under the chairmanship of Donald Young, to review the organization and operation of the behavioral science programs in the Federal government. As a result of the study and review, ten major recommendations were made which mainly centered around the effective use of knowledge, foreign affairs, international cooperation in research, science policies, support for basic research, and the future orientation of research and public policies (involving a national institute).

- National Science Foundation

  Federal Support to Universities and Colleges, Fiscal Years 1963-66

  NSF 67-14. U. S. Government Printing Office. Washington, D. C. July, 1967.

  This report, prepared for the Office of Science and Technology, shows that during FY's 1963 to 1966 the total Federal obligations to universities and colleges increased from $1.4 billion to $3 billion, but there were changes in emphasis, types of support and the distribution of funding. Federal obligations for academic science showed sizable gains over the four-year period, but nonscience activities accounted for nearly 1/2 of the increase in total Federal obligations (from $85 million in 1963 to $847 million in 1966). The Office of Education and the Public Health Service accounted for nearly 2/3's of the Federal total in 1966 ($945 million and $940 million); NSF provided 12% of the total, and DoD 10%. Trend occurred towards wider and more even distribution of funds in 1966 among states and institutions; all of the 50 states, District of Columbia and Puerto Rico shared in the increase in funds and the total number of institutions sharing in funds increased from about 840 in 1963 to about 2,050 in 1966, when about 4/5's of all of the nation's colleges and universities were receiving Federal support.

- National Science Foundation

  Industrial R & D Spending, 1968

  Science Resource Studies Highlights. NSF 70-12. National Science Foundation. Washington, D. C. 1-4. May 25, 1970.

  Research and development has increased in private industry but this has been accompanied by cutbacks in Federal spending. Basic and applied research account for about 20% of R & D funds in 1968 with the Chemical industry leading in basic research. Aircraft firms use most of their funds for development work, mostly on guided missiles and spacecraft. The largest percentage gain from 1959-68 was in the area of professional and scientific instruments.

- Orlans, Harold

  The Effects of Federal Programs on Higher Education

  Brookings Institution. Washington, D. C. 1962.

  This is a comprehensive review of the results of a study of the effects of Federal programs and funds on higher education at 36 institutions. The institutions are classified into three groups: Group I--those receiving large sums, Group II--those receiving smaller amounts of Federal money, Group III--good liberal arts colleges. Questionnaires and interviews were used to gain faculty opinion on quality, governmental role in higher education, desired and actual allocation of faculty time to teaching, research and administration, im 1960-61. Graduate schools were ranked by departmental chairmen in 1925 and 1957 and relative changes are given. Federal programs did not alter the relative

standings of faculties in science and social science departments at Group I or II institutions. Conclusions and recommendations regarding Federal funding and policies, their influence and effect, are given.

● Panel Discussion: Rhodes, Herbert D., presiding; Joseph C. Boyce, Aaron Ganz, F. D. Hansing, Howard D. Kramer, Robert Walker, panel members

What's New on the National Scene?

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 100-119. December, 1967.

The various panelists discuss federally funded programs in higher education at NIH, NASA, NAS-NRC, NSF, and the National Endowment for the Humanities. Large increases in Federal expenditures for research and education and economic pressures from the Viet Nam War have caused more careful scrutiny of education expenditures; there is more emphasis on broadly focused projects with overall institutional impact rather than mission or individual oriented programs, and on humanistic approaches to social problems.

● Reitz, J. Wayne

Historical Survey of the National Defense Education Act, Title IV

Proceedings of the Eighth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. San Francisco. 135-141. December, 1968.

This is a historical review and statistical summation of Title IV, the Graduate Fellowship program of the National Defense Education Act, after ten years of experience. Reitz believes it is the most significant piece of legislation since the Morrill Act of 1862. The legislation achieved its primary purpose of producing quality Ph.D. college teachers (66% of the fellows from 1959-62 are teaching in colleges) and has met the needs of graduate students and universities. Geographical distribution was maintained by making awards to the universities directly. Part of the success of the program is due to its having a rotating graduate dean as chief of the program. Since 1958, 26,828 fellowships have been awarded, valued at $355,085,175 (cost-of-education allowance included).

Private Foundation Programs

- Danforth News and Notes

  Progress Report: Opportunities for Opportunity Fellows

  Danforth News and Notes, Volume VI, No. 3, 1-3, March, 1971.

  This is a progress report of the Opportunity Grants awarded to disadvantaged/minority groups by the Board of the Danforth Foundation. In January, 1966 the Danforth Foundation decided to award funds to individuals from disadvantaged backgrounds. The recipients of these grants were selected as Opportunity Fellows by the four institutions (Vanderbilt, University of Cincinnati, UCLA, and University of Wisconsin) which were awarded the institutional grants. Since these programs only began operating in 1966 and 1967 a full measure of the success could not be made; however, apparent in each institution's progress report was the need for such programs and the number of potential grantees was believed to be greater now.

- Harmon, Lindsey R.

  The Ford Foundation Forgivable Loans in Support of Graduate Education in Engineering: A Program Evaluation

  Office of Scientific Personnel, National Research Council-National Academy of Sciences-National Academy of Engineering. Washington, D. C. May, 1970.

  This is an evaluation of the Ford Foundation Forgivable Loans Program, instituted in 1960 and terminated in 1966, in support of graduate education in engineering with the objective to increase Ph.D. faculty members in engineering schools with the inducement of reducing the loan 20% for each year of teaching. It concluded that the program did not have a measureable effect in the intended direction, but many other strong influences existed during the period which effected profound changes in the training and employment of engineering Ph.D.'s while the loan program was active. Only 10% of Ph.D. candidates had Ford Foundation Forgivable Loans at the height of the program, and it is probable that the loans achieved the desired result by facilitating the graduate education of those already inclined toward teaching, rather than a diversion to teaching of people whose original goals were non-academic. The study shows also the phenomenal growth of engineering Ph.D.'s during 1958-1968, and illustrates graphically the geographical, institutional, specialization and background characteristics of engineers, by special fields.

● Morison, Robert S.

Foundations and Universities

The Contemporary University: U.S.A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 77-109. 1966.

Foundations have played a direct role in changing the character and in raising the standards of American colleges and universities. The main external influences have been the Rockefeller Foundation, Carnegie Foundation, General Education Board, and the Federal government. Foundations have encouraged the development of special purpose groups, which are not always academic in nature. Foundation support in social sciences has been more difficult to obtain and the amount of support in the humanities has been most frequently criticized. The question is raised whether the quotient--the amount of available money divided by perception--still favors government over foundation support.

● Woodrow Wilson National Fellowship Foundation

Report for 1969-1970

Woodrow Wilson National Fellowship Foundation. Princeton, New Jersey. December, 1970.

This summarizes the programs of the Foundation and indicates that financial support for graduate students is going to be harder to obtain in the future. In the light of this, the First Year Program is being redesigned to finance those applicants (300), who have top priority, with Foundation funds and to designate the next 700 to the universities for institutional support. In 1969-70 the Foundation elected 1,157 applicants as designates and of these institutions supported 73%, 10% dropped out, and the Foundation supported 15.4%. One hundred of the designees received special independent study awards ($1,000 for a summer), which were given to those considered the cream of the group. Other programs sponsored by the Foundation include: programs geared to the improvement of developing institutions, bringing the humanities to rural America, encouraging study in the social sciences and humanities, providing fellowships for promising black veterans with a college degree to attend graduate school in order to prepare for careers in public services (Martin Luther King Fellowships), serving as a placement service for British teachers to work two years in the United States to broaden their students' perspective and as a means of improving the inage of our nation to the British when they return, and serving as a clearing house for black veterans seeking an appropriate graduate school.

Students and Stipends

● Bock, Robert M.

On the Survival of Quality Graduate Education: A State and National Crisis

University of Wisconsin. Madison, Wisconsin. (Mimeographed.)

This is an incisive review of the dramatic effects, beginning in 1967, of recent national and state events that are gradually and decisively leading to dismantlement of the valuable infra-structure for graduate training capability assembled at great cost in the post-Sputnik era during the 1960's. Although the University of Wisconsin is used as the example, the fact that overall financial aid for graduate students decreased 10% from 1968-69 to 1969-70 and is estimated to drop 45-50% in 1971-72 is described as representative of the current situations being experienced by the larger productive graduate schools elsewhere in the United States. Both the positive and negative effects of retrenchment are reviewed for major programs and departments and the alarming conclusions being reached about present Ph.D. surpluses are questioned. The overall conclusion is that unless a reasoned approach is formulated and followed, the graduate capability, a critical natural resource, may be liquidated and is in serious jeopardy now and in the future.

● Brandt, Thomas O.

Competition for Graduate Fellowships

School and Society, Volume XCV, 394, October 28, 1967.

The author reviews the process in which students compete for graduate fellowships and the fine differences upon which their success or failure depends. Shortcomings of the process are discussed. Need for an award as a factor is proposed, as is limiting a successful applicant to accepting only one substantial award.

● The Chronicle of Higher Education

Graduate Fellowships Drop by 62 Percent over Four Years

The Chronicle of Higher Education, Volume IV, No. 33, 7, May 25, 1970.

Information obtained from government sources are reported by the Woodrow Wilson Fellowship Foundation indicating that federally supported first-year fellowships will be nearly 62% lower in 1971-72 than in 1967-68. Those available under six Federal programs will drop from a peak of 11,125 in 1967-68 to 6,093 in the fall of 1970, and will decline further to 4,247 in 1971-72. The Chairman of the Wilson Foundation called for renewed private support of graduate education, and an underutilization of Ph.D.'s rather than a surplus was viewed as characterizing the current situation.

- Falk, Charles E.

  Financial Support of Graduate Students

  Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 37-50. July, 1969.

  This article reviews and discusses: the objectives of support of graduate students (to enable and stimulate qualified graduate students in larger numbers to initiate and complete graduate studies faster, and to stimulate them to enter specific fields to alleviate existing or expected manpower shortages), the sources and extent of financial support (in 1965 over half of students were supported from private sources and 42% from fellowships, teaching and research assistantships; great imbalance exists between science and social sciences--80% in science and engineering had support with 40% being Federal support). It concluded that policy issues of support are not over-encouraging graduate education but present methods and patterns of support may have to change, i.e., loans rather than fellowships and better field distribution of funds.

- The Federal Interagency Committee on Education

  Report of the Task Force on Fellowships and Traineeships

  The Federal Interagency Committee on Education. Washington, D. C. June, 1968.

  Statistical data presented in the report depicted: graduate enrollment from 1960-1965 and projections for 1966-1968, Federal support and full-time enrollment by fields, percentage of enrollment supported by Federal fellowships or traineeships, numbers of students supported by fields, new awards by agency, and dollars allocated for support. Apparent in the statistics were: while Federal fellowship and traineeship support grew more rapidly than did graduate enrollment from 1960-68, it diminished in proportion to the enrollment in 1967-68; a larger proportion of students in the natural sciences and engineering received Federal support in 1968 than did those in social sciences and nonscientific fields, even though Federal support substantially increased for the latter. EMP fields and life sciences continued a steady growth; education had the least support in 1960, but received more than any other field in 1968. The committee's recommendations were directed toward coordination of Federal planning for graduate support--examination of nation's future needs in professional and graduate education, study of total amounts of funds for graduate support by level, field and type; establishment of a representative panel of Federal agencies supporting graduate study to review the support of graduate education and training programs.

● The Federal Interagency Committee on Education. Student Support Study Group

Report on Federal Predoctoral Support: Part I - Fellowships and Traineeships

Federal Interagency Committee on Education. Washington, D. C. April, 1970.

This report updates, expands and succeeds the Report of the Task Force on Fellowships and Traineeships issued in June, 1968 by FICE. The 1968 report showed that Federal support was dwindling in relation to graduate enrollment and the present study reveals a further, substantial decline from 1968 in dollars as well as in numbers of students supported during the 1969-70 academic year. The overall conclusions were: from 1960 to 1968, the numbers of students receiving Federal fellowships and traineeships increased from 7,999 to 51,289 and funds for these increased from $31,651,000 to $257,587,000; enrollment during the ten-year period has nearly tripled, although the rate of increase slowed in the fall of 1968 and may continue to do so in the coming years. The downward trend in Federal fellowship and traineeship support beginning in the 1968-69 academic year has continued even more sharply into the 1969-70 academic year--fall 1969 figures show a 9,000 decrease in numbers and a $39 million decrease in funds compared to fall 1968; the percentage of the enrollment supported grew from 6.4% in 1960 to a high of 17% in the fall of 1967, fell to 16% in 1968 and to 12% in 1969, and budget estimates for the 1970-71 and 1971-72 school years reflect a further sharp drop in support. Trend indicates that most graduate schools will have to curtail admissions and time to complete degrees will lengthen; most educators feel that Federal cutbacks of student support coupled with reductions in R & D support can have a devastating effect on the national economy and future leadership. Report recommends a further review of the total graduate student support picture from all sources along with the need for various types of highly trained manpower for transmittal to the Executive Branch for use in formulating a long-term national policy.

● Friedrich, Lawrence, Lawrence C. Howard, S. M. Nabrit, Hans Rosenhaupt

Financial Support Programs

Proceedings of the Eighth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. San Francisco. 94-119. December, 1968.

This panel discussion by Nabrit, Howard, Rosenhaupt and Friedrich summarizes financial support programs for the disadvantaged graduate student, primarily for blacks. Several programs are reviewed as to their extent and impact: Southern Fellowship Fund, Ford Foundation program, Rockefeller Foundation program at Haverford, John Hay Whitney Opportunity Fellowships, HEW and NEH programs, Martin Luther King Fellowships, and others. Most of these programs were developed recently to satisfy rising aspirations for Negroes who have potential but who may not be especially competitive in national support programs. A case was presented against conducting educational opportunity programs at the graduate level for the disadvantaged only at white universities. There has been only sparse participation of Negroes in the Woodrow Wilson program because committees have failed to judge black candidates in terms of their own culture.

● Hobbs, Walter C., and G. Lester Anderson

Research Support for Graduate Students

College and University, Volume XLIV, No. 2, 154-157, Winter, 1969.

The author collected data on the research support of graduate students at the State University of New York at Buffalo between 1962-1965. Support received by students in the natural and life sciences was compared to that received by students in the social sciences and humanities. The former were found to receive more support than the latter because they are more useful as research assistants in the faculty advisor's project; however, the faculty advisors' projects were the least common source of support of all types for both categories of students. The natural and life science students finished their graduate work and took degrees at an earlier age and in shorter time than social sciences and humanities students; the latter take more than three years in completing their degree research, less are employed by the university than elsewhere, and there are 1/4 to 1/3 less Ph.D. candidates than in the sciences.

● Lester, Charles T.

Computerized Matching of Applications and Awards

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 20-24, December, 1967.

A proposal was presented for a stepwise pilot study to survey students and departments of economics (as a test field), wherein machine methods would be used to match applications to student awards in 1968. Restrictions were outlined. Postscript: the experiment did not work out and the proposal has not been pursued further.

● National Science Foundation. Division of Science Resources and Policy Studies

Graduate Student Support and Manpower Resources in Graduate Science Education, Fall 1969

NSF 70-40. U. S. Government Printing Office. Washington, D. C. 1971.

This report summarizes statistical data on graduate student support, post-doctorals, and graduate faculty as of fall 1969 in science and engineering in the 2,894 doctorate-granting departments of 224 institutions that furnished data on NSF traineeship applications for 1970. Graduate enrollments in the departments for fall 1969 totaled 184,845, distributed as follows: 28% in the engineering sciences, 20% in the social sciences, 17% in the life sciences, 19% in the physical sciences, 8% in the mathematical sciences, and 7% in psychology. The enrollment was 2.8% higher than in the fall of 1968. Full-time students represented 76% of the sample, 83% were U. S. citizens, and 35% were first-year

students (65% were beyond the first-year level). Types of major support of the full-time students were: fellowships and traineeships--30%, T.A.'s--23%, R.A.'s--22%, and other support including self-support--26%. Fellowship and traineeship support decreased 6% from 1967-68 to 1968-69; R.A. support decreased 0.8%, while T.A. support increased 3.6% and other support increased 11.6% during the same period. Full-time graduate science students (81%) received $1,200 or more annually, exclusive of tuition from outside sources; the Federal government financed 37% of the total full-time students, or 51,620, by means of fellowships-traineeships (56%), R.A.'s (38%), T.A.'s (1%), and other types (6%). Institutions and state and local governments financed 36% of the full-time students; outside sources, such as industry and private foundations, supported 9%, and the remaining 19% relied upon self-support. The leveling off of Federal support, partially offset by increases in institutional and self-support, was a factor in the reduction of growth rate in graduate science enrollment from 1967-69. The reporting departments in the study indicated 54,549 faculty members in 1969, an increase of 5.1% over 1968. Eighty-four percent, or 45,687, were graduate faculty members, distributed as follows: 25% in the life sciences, 21% each in the engineering and the physical sciences, 17% in the social sciences, 10% in the mathematical sciences, and 6% in psychology. Postdoctoral appointments totaled 8,517 in the reporting departments in 1969--an increase of 10.3% over 1968; 44% of these appointments were concentrated in the physical sciences and 38% in the life sciences.

- National Science Foundation. Office of Planning and Policy Studies

  Graduate Student Support and Manpower Resources in Graduate Science Education

  NSF 68-13. U. S. Government Printing Office. Washington, D. C. 1968.

  Data collected by the Office of Planning and Policy Studies from information submitted by science departments for graduate traineeships in the falls of 1965-1966 are reported. Averages for all sciences, life-medical, engineering, mathematics, physical sciences, social sciences, and psychology are presented for 41 fields of sciences, and other statistics and highlights are summarized. Salient findings were: about 25% of students in doctorate-granting and 50% in master's departments were part-time, engineering had the largest number of part-time students and the life-medical and physical sciences the least, foreign students increased to 17.8% in 1965 but decreased to 16.8% in 1966, first-year students comprised about 1/3 of all full-time doctoral students--declined from 1965 to 1966, was highest in engineering (41%) and lowest in physical sciences (28%), 3/4's of all full-time students in doctoral departments and 2/3's in master's departments received support of some form, ranging from 90% in physical sciences to 60% in social sciences in doctoral departments. About 40% of the support for United States students and 22% for foreign students in doctoral departments come from the Federal government, with about 1/3 of all full-time doctoral students receiving fellowships or traineeships; T.A. and R.A. support in doctoral departments was provided to about 25% of the full-time students, and advanced students relied more on R.A. support than from other sources; postdoctorals were mainly concentrated in the physical and life-medical doctoral

departments. In 1966 the postdoctoral count was 17.5% of the full-time graduate faculty, 5.3% of the full-time graduate enrollment, and 60% of the doctorates awarded in 1965.

- National Science Foundation. Planning and Evaluation Unit. Office of the Associate Director (Education)

  Support of Full-Time Graduate Students in the Sciences, Fall, 1967

  NSF 69-34. U. S. Government Printing Office. Washington, D. C. 1969.

  This report is based on statistical data required as a part of departmental requests for support of Graduate Traineeship Programs; about 3,000 master's and doctorate science departments in 209 institutions granting doctorates in at least one science supplied information as to graduate student enrollments and support in the fall of 1967. The major findings were: 133,972 full-time graduate students were enrolled in the reporting departments, about 1/3 were first-year students; 95% were enrolled in doctoral departments, about 32% were supported by fellowships or traineeships, about 23% by research assistantships, 23% by teaching assistantships, and about 23% received other or no support; non-federal funds supported 57.7%, Federal funds 40.7%, and 1.6% by foreign funds; NSF provided nearly 1/4 or 23.4% of the federally funded awards with students in doctoral departments holding 97.4% of the NSF awards.

- Panel Discussion: Miller, John Perry, chairman; Alan Ferguson, Stephen P. Hatchett, Byron Houston, Hans Rosenhaupt, panel members

  Is Closer Articulation of National Fellowship Programs Desirable and Possible?

  Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 139-149. December, 1963.

  In this panel discussion on the closer articulation of national fellowship programs, the following questions were discussed: coordination of award dates of national fellowships with graduate school acceptance, sources of fellowship funds, and overlap of fellowship funds. Recommendations concerning these were made.

- Predmore, Richard L.

  Does Graduate Education Deserve NDEA Support?

  Proceedings of the Eighth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. San Francisco. 148-153. December, 1968.

  Predmore, former Chief of Graduate Fellowship Programs of the National Defense Education Act, indicates that funding for these fellowships will not be continued in the future unless it can be demonstrated that substantial benefits to society result from such support. Graduate education will not

continue to receive generous support unless it is able to show that it can contribute in a creative and civilized way to the revolutionary changes through which society is destined to pass. More generalists, not specialists, are needed to solve the larger problems. Attitudes and practices in our graduate disciplines, modified along broader lines and designed to encourage change not resist it, can contribute to what is needed and required.

● Taylor, Donald W.

Financial Aid to Students Admitted to the Yale Graduate School in the Fall of 1971-72

Yale Graduate School. New Haven, Connecticut. March 15, 1971. (Mimeographed.)

Continuing reductions in Federal and other support are forcing graduate schools to find other ways of providing financial aid to graduate students. To meet this need, Yale, beginning in 1971-72, will make available in the Graduate School, Yale College, and in several professional schools, a new Contingent Repayment Plan making it possible for the student to defer payment of a part of his educational expenses. Repayment begins after a student completes his education, with the amount contingent upon the amount deferred and the amount of his income. For graduate students entering in fall of 1971-72, participation in the Plan will be limited to the amount specified in the letter of admission. Specifically, an eligible student electing to participate in the Plan obligates himself to pay Yale 0.4% of his adjusted gross income for each $1,000 received for not more than 35 years, a minimum payment of $29 per year for each $1,000 received will be required, regardless of income, and repayment would begin after the last year of enrollment for full-time study.

● U. S. Department of Health, Education, and Welfare. Office of Education, by John L. Chase

Doctoral Study: Fellowships and Capacity of Graduate Schools

OE-54016 Circular 646. U. S. Government Printing Office. Washington, D. C. 1961.

This study and survey for 1959-60 involved the financial support for fellowships (35 million) from all sources at 139 doctoral-granting institutions and is now mostly of historical interest. Distributed by field the support was: 41% for mathematics, physical sciences and engineering; 19% for the social sciences; 19% for the biological sciences; 16% for the humanities; and 5% for education. By source: 59% came from university fellowships and tuition fellowships, 26% came from Federal sources, and 14% came from private foundations. Chase concluded that the 139 institutions had capacity for considerably more doctoral candidates but most serious barrier to further expansion was the lack of financial aid to graduate students, followed by the lack of academic faculties and lack of qualified students.

● U. S. Department of Health, Education, and Welfare. Office of Education, by Joseph Froomkin

Graduate Education

Aspirations, Enrollments, and Resources: The Challenge to Higher Education in the Seventies. OE-50058. U. S. Government Printing Office. Washington, D. C. 65-74. 1970.

Froomkin suggests that further support to graduate education and related R & D activities should be examined in light of the decreasing demand for scientists and reduced employment opportunities for M.A.'s and Ph.D.'s in the educational sector. He reviews the information on graduate student support obtained in the OE Survey of 1965 and draws several inferences of the impact of graduate instruction on institutional costs. The author concludes: the majority of students wanting to go to graduate school will find the money to do so somewhere; the source of support does not determine what fields students enter, graduate education has a major effect on institutional finances; institutions do not want to decrease enrollments because of facilities and teachers available and loss of T.A.'s for undergraduates; the practice of having T.A.'s teach undergraduates should be reviewed; Federal support should be tied to supervision and training in teaching; it is fairer to subsidize all students of promise, irrespective of discipline; and a new formula for matching grants to institutions may be needed.

● U. S. Department of Health, Education, and Welfare. Office of Education. National Center for Educational Statistics

The Academic & Financial Status of Graduate Students, Spring 1965

U. S. Government Printing Office. Washington, D. C. 1967.

A survey of a nationwide sample of graduate students, representing about 3% of the students enrolled for graduate degrees (excluding first professional degrees) in the spring of 1965, was conducted. Characteristics of the student sample are given: only 44% were enrolled full-time, Negroes represented only 3%, 10% were foreign, more than half came from low-income families, men predominated in the sciences and professional fields while women outnumbered men in education and the humanities. Total dollars for financing graduate study were estimated at $1,654,843,000. About 43% held stipends (with 67% of these held in the sciences as compared to 20% in education), about 1/3 held fellowships, 1/5 held R.A.'s, 1/4 held T.A.'s, and 1/4 held scholarships; the dollar value of the stipends ranged from $500 to over $4,500, but about 1/2 held stipends between $1,500 and $3,000. Part-time work extended time to obtain the doctorate--69% had begun work before the 1961-62 academic year; the most serious obstacle cited for delaying completion of the doctorate by both full-time and part-time students was financial difficulties.

● Walsh, John

Federal Graduate Aid: Down But Not Out

Science, Volume CLXVIII, No. 3939, 1559-1561, June 26, 1970.

Walsh presents a comprehensive digest of recent actions and reviews pending changes in support of graduate students by the Federal agencies. A shift in direct grants and support to loans is a major change in policy in support of graduate work, but to date there has been little public discussion on the impact of this change. Overall, predoctoral and postdoctoral fellowships portend to be reduced 50% or more and restrictions on financial aid auger to be the limiting factor on graduate enrollments this year and in the future. The decrease in expected support is happening when public institutions particularly are experiencing marked increases in applications for admission; a sense of urgency and crisis exists in graduate student support for the immediate future, but apparently the full impact is yet to be realized at the university level.

● Warkov, Seymour, et al.

Graduate Student Finances, 1963: A Survey of Thirty-Seven Fields of Study

Report No. 103. National Opinion Research Center. University of Chicago. Chicago. September, 1965.

This survey was conducted in the spring of 1963 at the request of NSF to provide up-to-date information on the sources, types and amounts of support available to graduate students; the effects of stipend holding on academic progress; patterns of employment; and other aspects of graduate education. The data are from a questionnaire completed by 20,114 graduate students sampled from 130 graduate schools. The principal findings are summarized by five composite fields: physical sciences, life sciences, engineering, behavioral sciences, and humanities. Major findings were: about 3/4's of the students were aiming for the doctorate, the majority were attending part-time, stipend holding varied from a low of 46% in the humanities to a high of 80% in the life sciences, the average for all fields was 66%, overall about 2/3's of all stipends came from non-Federal sources, and the median cash values ranged from a high of $2,700 in the life sciences to a low of $2,000 in the humanities.

General Support and Factors

● Bowen, Howard R.

The Financing of Higher Education: Issues and Prospects

The Future Academic Community: Continuity and Change. John Caffrey, editor. American Council on Education. Washington, D. C. 205-219. 1969.

This paper was designed as an outline of some of the major issues and choices, not as a plan for financing higher education. After reviewing the magnitude of expenditures from 1950-1968, Bowen estimates the size of the future bill required: future institutional costs are bound to increase because of higher enrollments (from 6.5 million in 1967 to 11 million in 1979-80) and cost/student (rate of 4-5%/year) to give a combined total cost rate increase of 9%/year; at this rate operating costs will increase from about $12 billions in 1967-68 to about $33 billions in 1979-80--adding capital costs will bring the total to at least $40 billions by 1979-80. Bowen has grave doubts that efficiency can be improved without sacrificing quality of performance. The nation can afford to support the costs if given the will to do so, but persuasion will become progressively more difficult; the pattern of support and system of finance are likely to change in the next decade with a larger share required from the Federal government.

● Crowl, John A.

Financial Crisis Worsens for Colleges: Some Close, Many Show Deficits

The Chronicle of Higher Education, Volume IV, No. 38, August 31, 1970.

The financial crisis that educators have been talking about for several years is, in the minds of many leaders, here as the result of operating costs rising more rapidly and dramatically than traditional sources of income. Several small colleges have closed (USOE reports 21 institutions since 1968-69); and many, including some with national stature (Princeton, Columbia, St. Louis, George Washington, Georgetown, etc.) are reporting large operating deficits. Conclusion is that financing will be the most serious problem of the 1970's, aggravated by past and possible future student dissent and disruptions. Major causes of rising costs are: inflation; rising faculty salaries (5-7% a year in last decade); unionization of non-academic employees (resulting in higher salaries and fringe benefits); doubling of capital costs in the last five years; and the depressed condition of the stock market (resulting in decreased earnings and decreased corporate and private foundation contributions). Although both public and private institutions have raised tuition and fees, the breaking point has almost been reached. Major issue is whether citizenry really believes that investment in education is worthwhile and will, therefore, provide necessary funds--in this regard, institutions must present their cases better.

- Crowl, John A.

  1,540 Campuses Facing 'Hard Times' Financially, Carnegie Panel Estimates

  The Chronicle of Higher Education, Volume V, No. 11, 1, 3, 4, December 7, 1970.

  The Carnegie Commission's findings on the financial crisis in higher education and steps being taken to alleviate it are reviewed. The essential problem revolves around rising costs and declining income: many institutions are undercapitalized, overextended, and moving into areas of responsibility without permanent financing. Most presidents felt that only restoration of public confidence in higher education could reverse the present trends. Both beneficial and detrimental effects of the money crisis are discussed: general belt tightening; elimination of graduate and professional programs; cutting of interdepartmental and specialized high cost programs and services; and ways to increase efficiency and increase funds, including tuition increases.

- Harris, Seymour Edwin

  Higher Education: Resources and Finance

  McGraw-Hill Book Company. New York. 1962.

  Harris' book summarizes 170 points, describes the current conditions in institutions of higher education from primarily the financial aspect, and makes predictions for the future. His data are based on statistics from the fifties. Trends in costs of education and possible sources of revenue to fund these costs are discussed. He predicts a rise from the four billion dollars spent in operating costs for higher education in 1960 to nine to ten billion by 1970, and indicates that these funds will involve large increases from all sources, but especially from government and increased tuitions. His book deals in detail with scholarships, fellowships, loans, endowments, faculty salaries, locations of institutions, quality in education and size of institutions.

R E C O M M E N D A T I O N S

CURRICULA, DEGREES, PROGRAMS

● Arlt, Gustave O.

The Future of Graduate Education

Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 135-140. July, 1969.

This is a sequel and "wrap up" paper to Arlt's opening paper at the Workshop, in which he prognosticates the future of graduate education based on stipulations and assumptions regarding various factors over which the educational community has little control. Arlt foresees the gradual evolution of an integrated system of advanced education beginning at the post-junior college level and continuing through life. Approximately the first four years will consist of full-time study fully subsidized by Federal and State support. Basically the bachelor's degree will slowly but surely disappear since in reality it serves as a partial admission ticket to graduate school; the master's degree or other intermediate degrees will mark the end of this full-time stage of advanced education. The graduate school will become an integral part of an endless continuum of advanced education--part-time study and part-time employment for the remainder of an individual's life; under this system it may take a student five more years to complete his Ph.D., but in doing so he will be a productive member of society and his experience reinforces his education and his professional competence.

● Commission on MIT Education

Creative Renewal in a Time of Crisis

Report of the Commission on MIT Education. November, 1970.

This is an initial report of a commission of eight faculty members and four students operating under a broad charge to chart general objectives, but focusing on issues deemed to be of the highest priority and with an opportunity for feedback. In a sense, the report is a self-examination of the entire institution which calls for an effort of creative renewal. Germane to graduate education and research are several recommendations: mandatory that adjustments in policies and programs will have to be made because of uncertainties in future funding and shifting patterns of career opportunities for scientists and engineers; graduate programs should be reviewed with the needs of the individual student as an area of central concern; and attention should be given to an internal review system, the delineation of rights and responsibilities of faculty and students in doctoral study, and the role of teaching and internship in graduate training. It concluded that the faculty should play a dominant role in making the necessary decisions needed to cope with the changing constraints and conditions.

- Dean, Donald S.

  Preservice Preparation of College Biology Teachers: A Search for a Better Way

  Commission on Undergraduate Education in the Biological Sciences, American Institute of Biological Sciences. Washington, D. C. November, 1970.

  This report culminated from the CUEBS project on the challenge to identify the skills of the effective teacher and to cultivate them in those susceptible to improvement. Dean reviews what has been done, and by whom; suggests what should be done and alternatives; and summarizes the results of the regional conferences sponsored by CUEBS. It concludes that the university is about the only place where one can earn the credentials to become a college teacher; if the university fails to do a creditable job of giving the proper preparation, the inadequacy is reinforced in an endless cycle of poor performance. Recommendations are made to the graduate schools and hiring institutions to improve and correct the cycle of mediocrity.

- Eckert, Ruth E., and Robert J. Keller, editors

  A University Looks at Its Program: The Report of the University of Minnesota Bureau of Institutional Research, 1942-1952

  The University of Minnesota Press. Minneapolis. 1954.

  This report by the University of Minnesota Bureau of Institutional Research is a self-study of the institution conducted by faculty members and administrators; most of the findings and recommendations, although applicable to graduate work generally, are primarily of local and regional importance. Pertinent recommendations are: more careful initial selection and admission, more adequate financial assistance for worthy candidates, better planning and evaluation of graduate programs, and liberalization of the Ph.D. language requirements.

- Handler, Philip

  Science and Government--Opportunities and Conflicts

  Science, Government, and the Universities. University of Washington Press. Seattle. 84-108. 1966.

  The author comments on the establishment of interdisciplinary institutes and "centers of excellence," the transfer of Federal funds to universities, and suggests guidelines for types of grant programs needed and for improving the image of science at all educational levels and in society. The prospects for biology, within the broader framework and its role in solving as well as creating future problems with moral, political and legal implications, are discussed.

- Kelly, Sam

  Four Suggestions for Graduate Work

  Improving College and University Teaching, Volume XVIII, 9-10, Winter, 1970.

  The author proposes a theoretical institution, offering a range of undergraduate majors and a number of graduate specializations, which would cooperate with other institutions in four ways to improve opportunities for students and faculties: a cooperative and shared teaching faculty in specialized programs; a thesis committee pool from the parent and cooperating schools; exchange of students on a state and regional basis; and a consortium of "outside" scholars, artists, scientists, not associated with the colleges or universities, but contributing to and participating in the programs.

- National Science Foundation. Advisory Committee for Science Education to the National Science Board

  Science Education--The Task Ahead for the National Science Foundation

  NSF 71-13. National Science Foundation. Washington, D. C. March, 1970.

  The National Science Board in 1969 asked the Advisory Committee for Science Education to evaluate the effectiveness of the Foundation's programs to date in science education, including, in particular, the course content improvement activities, and to make recommendations for the decade ahead. The report submitted, along with the support papers from Drs. Greenberg and Platt, is the response to the request and stresses one dominant goal for the 1970's: "To educate scientists who will be at home in society and to educate a society that will be at home with science." The Advisory Committee makes both general and specific recommendations by levels of education. Among the major recommendations in the report are: increased emphasis on the understanding of science and technology by those who are not, and do not expect to be, professional scientists and technologists; creation of alternatives in the training of future professionals for careers in science and technology; and increased use of technology in education, particularly television and computers. Recommendations specifically for graduate education include: an expanding program of fellowships and traineeships for graduate study in science, special projects in graduate education supported at a meaningful and appropriate level, support for "practitioner" degree programs such as the D.A., and support to revitalize the Master's degree as preparation for intermediate careers in teaching and practice of science.

- National Science Foundation. National Science Board. Philip Handler, chairman

  The Physical Sciences

  Report of the National Science Board submitted to the Congress. U. S. Government Printing Office. Washington, D. C. 1970.

  This second report of the National Science Board pictures the physical sciences as the pacemakers of our civilization. Important aspects reviewed and examined are: the current state of the physical sciences; the nature of the physical sciences enterprise; and the health of U. S. efforts from the viewpoint of universities, government, and industry. Sixteen recommendations made for maintaining and improving excellence in science center around priorities in education, research, application, financial support, the role of basic science in social utility, and the role of NSF.

- Panel Discussion: Adkisson, Virgil W., presiding; Sanford S. Elberg, J. P. Elder, Mina S. Rees, panel members

  What the Graduate Schools Expect of the Colleges

  Proceedings of the Third Annual Meeting. Council of Graduate Schools in the United States. Washington, D. C. 28-39. December, 1963.

  This panel discussion deals with three approaches to preparing undergraduates for graduate school. Dean Elberg of the University of California at Berkeley proposes earlier specialization so that the undergraduate years are less concerned with fragmented fields of emphasis and more concerned in acquiring the elementary tools for the graduate phase. He would stress proficiency in foreign languages and better counseling of undergraduates about graduate study. Dean Rees of the City University of New York believes the undergraduate schools must be updated because secondary school curriculum is so advanced today; she would still retain breadth in education but update the courses. Dean Elder of Harvard University strongly supports a liberal education and would avoid narrow specialization, but he suggests some early exciting research projects to introduce the undergraduate to research. The emphasis of Dean Elder's undergraduate curriculum would be on languages, particularly English, and teaching undergraduates to write by requiring a senior thesis.

- Schultz, John D.

  The Campus Is Restless: The Use and Abuse of Drugs

  Report of a Legislative Work Conference on Higher Education. Robert H. Kroepsch and Dorothy P. Buck, editors. Western Interstate Commission for Higher Education. Boulder, Colorado. 48-52. February, 1970.

  The illicit use of drugs usually involves heroin, LSD and marijuana; heroin is not a problem of schools and colleges but usually of high school dropouts. The use of LSD appears to have leveled off but use of marijuana

is on the uprise among teenagers and college students. We are dealing with a primary problem of education, both academic and public, and at all social levels; the most enlightened teaching available should be used, and if any state does not have a commission on drug abuse, one should be instituted.

- Seaborg, Glenn T., and Jacques Barzun

The Sciences and the Humanities in the Schools after a Decade of Reform: Present and Future Needs

Occasional Papers Number Thirteen. Council for Basic Education. Washington, D. C. April, 1967.

These are two addresses by the authors--Seaborg on the sciences and Barzun on the humanities. Seaborg stresses the importance of basic education and notes the strengths and weaknesses of our educational system. He discusses the strides made since Sputnik in raising the level of science teaching and the trend towards stressing graduate education. Seaborg views the greatest need of the future as a judicious combination and evaluation of the efforts of leading scientists and psychologists and educators to produce the best teachers and subject materials possible (another million teachers needed between 1970 and 1974). Barzun thinks common sense should guide and pervade education in the future--a backward look at the failures of the past is futile. Curricular changes in the humanities are not as important as in the sciences; what is needed are changes in spirit and desire. He feels that a set of principles and convictions is overriding to all education; we should forget about schemes and gimmicks and get back to the basics taught by great teachers.

- Shannon, James A.

Biomedical Sciences--Present Status and Problems

Science, Government, and the Universities. University of Washington Press. Seattle. 61-70. 1966.

This contribution to the "Symposium on Science, Government, and the Universities," held at the University of Washington during a 1965 meeting of the National Academy of Sciences, discusses the following: history and development of the biomedical sciences from 1940, characterization and problems of the fields today (1966), and needs and purposes for the future as a socially purposeful enterprise. Examples of fields in need of attention and solutions to their problems are offered and discussed.

- Taylor, Harold

  The Teacher in the World: An Approach to Cultural Power

  The Graduate Journal, Volume VIII, No. 1, 143-158, 1968.

  In this article the author envisions the creation of an educational community whose awareness is world-wide; he proposes an education center, probably to be located in the United States, where students and faculty from all over the world come together to form a "world community" with a "world curriculum." The core idea behind this would be educating all students as teachers and teaching the different cultures of the world both here and abroad, on internships of some kind. The idea of students teaching each other--a partnership between student and faculty--is recommended as an ideal solution because the true test of education lies in whether a person can teach what he has learned to someone else, and in the process teach himself.

- U. S. Congress. House. Committee on Education and Labor. Commission on Instructional Technology

  To Improve Learning

  A Report to the President and the Congress. U. S. Government Printing Office. Washington, D. C. 1970.

  The Commission on Instructional Technology was established in the belief that technology, properly supported and wisely employed, could help meet some of the nation's most pressing educational needs. The commission in its year long study found that technology does have value for education and recommended six specific actions to provide the most effective possible application of technology to American education. At the heart of the specific proposals was the establishment of the National Institutes of Education within the Department of HEW consisting of several constituent institutes, and through them make grants to the universities and other independent research institutes, as well as conduct research itself. A chief function would be producing and distributing a wide variety of good instructional materials. The report recommended model projects to demonstrate the value of technology and the retraining and training of teachers in cooperation with industry to perfect the technology. The minimum initial funding required to implement the recommendations was estimated at about $565 million.

NATIONAL POLICY: FEDERAL SUPPORT, HIGHER EDUCATION (Graduate), SCIENCE, ETC.

- Association of American Universities

  The Federal Financing of Higher Education

  Association of American Universities. Washington, D. C. April, 1968.

  The thesis is developed that the strength of the nation rests in part on the strength and support of American higher education, and the importance of a broad, diversified, vigorous and growing system of higher education is fundamental. Seven principal recommendations are made and discussed in terms of Federal assistance required for higher education: expanded student aid programs, particularly loans for the needy and disadvantaged; extended and expanded fellowships, traineeships and cost of education allowances for graduate and professional education; larger Federal share in costs to expand faculties; stable, strong Federal support of research and institutional grants on the NSF pattern; recognition and support of research libraries, high speed computers, and international studies on a broad base; new funding for critical societal programs; initiation of a system of block or formula grants based on priorities, needs, and types of programs and purposes.

- Carnegie Commission on Higher Education

  Quality and Equality: New Levels of Federal Responsibility for Higher Education

  McGraw-Hill Book Company. New York. 1968.

  This report examines issues facing higher education in the United States during the latter part of the 20th century and makes recommendations to meet the needs for quality of result and equality of access. The study and recommendations rest on the assumptions that: the nation looks to our institutions of higher learning to meet many of our important needs, and most of what is needed or expected can be met by expanding the quality of the process and the opportunity to experience it. Four essential factors must be examined to evaluate present and potential strengths and finances--growth in size, growth in functions, rising costs, and sources of funds. Only new levels of Federal support will meet future needs by providing grants and loans to individual students; direct support to institutions to meet increased costs of expanding enrollments and to strengthen areas of national concern; and extension of support for research, construction, and special programs. Most of the recommendations concern undergraduate education but innovative proposals are made for the support of graduate students. Overall, the total costs of the various academic programs recommended for Federal support would be almost $7 billion in 1970-71 and would rise to almost $13 billion in 1976-77, as compared to current costs of Federal aid of about $3.5 billion; the Federal share of funding for higher education would rise from 21 to 35%, the state share would fall from 21 to 17% and the private share would remain at about 50%. A National Foundation for the Development of Higher Education and a Council of Advisors on Higher Education attached to the White House are recommended to be established to serve in advisory, review, study and policy making capacities.

- Chemical and Engineering News

  Pressure Builds for Central Science Agency

  Chemical and Engineering News, Volume XLVIII, No. 20, 48-49, May 11, 1970.

  This article reviews the latest version of the Daddario Subcommittee's recommendation for a National Institutes of Research and Advanced Studies (NIRAS) which would reorganize a major share of the government's responsibilities for United States science into one independent agency, consisting of three institutes, headed by an administrator. The National Science Foundation would be the core of NIRAS, with the first Institute having the current NSF natural science and national research programs, NIH research programs, the science information programs, and the proposed National Institute of Ecology. The second Institute would administer graduate education programs of NSF and the Office of Education, training programs of NIH and HEW units, and institutional support programs of OE, NSF, NIH, and Project Themis. The third Institute would consist of the National Foundation of the Arts and Humanities and the National Institute of Social Sciences (NSF's social science programs). Although endorsed by NAS, some NSF policy makers, certain Congressmen, and others, immediate formation appears unlikely because of opposition from the Administration and other groups.

- Cohn, Victor

  Scientist Urges Aid for Ph.D.'s

  Washington Post. July 22, 1970.

  This article concerns the comments of Philip Handler, President of the National Academy of Sciences, to the House Science Subcommittee on the subject of financing graduate study. His recommendations were: continue training large numbers of graduate students even with the present "Ph.D. glut" in some fields, a modified type of Ph.D. without independent research requirement, Federal stipends to all graduate students with two to five years service to the nation afterward, and a Federal research and education agency to centralize responsibility and planning--probably with the National Science Foundation as the cornerstone.

- The Commission on the Humanities. Barnaby C. Keeney, chairman

  Report of The Commission on the Humanities

  Sponsored by The American Council of Learned Societies, the Council of Graduate Schools in the United States, and United Chapters of Phi Beta Kappa. The American Council of Learned Societies. New York. 1964.

  Under the chairmanship of Barnaby C. Keeney, a Commission on the Humanities, sponsored by the American Council of Learned Societies, Council of Graduate Schools in the United States, and the United Chapters of Phi Beta Kappa was established to study the state of the humanities in the United States and to

make recommendations concerning it. In preparing its report, the Commission asked the 24 Learned Societies of ACLS to establish committees to report on the "present situation and the present and future needs" of its discipline; these reports are included as a Supplement to the Commission's Report along with separate reports by its Committee on the Schools (Appendix A) and Committee on Library Needs (Appendix B). After reviewing the contributions of the humanities and their current and future roles in American society, the Commission proposed the creation of a National Humanities Foundation to be established and supported by the Federal government, "to develop and promote a broadly concerned policy of support for the humanities and the arts," in much the same manner that the NSF has served the sciences. The scope, functions, organization and authority of the proposed Foundation are delineated.

● Cunningham, D. E.

Federal Support and Stimulation of Interdisciplinary Research in Universities

Miami University Research 69-142. Oxford, Ohio. October, 1969.

This report, conducted under the sponsorship of NASA, was written in an attempt to determine what actions the various agencies of the Federal government have been taking in stimulating and supporting interdisciplinary research. The Federal funding level of interdisciplinary research, actual and projected in 1969, totals $152.8 million: NIH at 61 million, NSF at 41.5 million, AEC at 10 million, DOD at 21 million, NASA at 5.5 million, and the remainder in other agencies. Major conclusion, of the eight made, is that the results to date are less than outstanding. Other conclusions were: the number of institutions able to conduct interdisciplinary research is very small, probably less than 50; it can occur at institutions only where central administration clearly believes in it and backs it; and Federal agencies themselves are discipline-oriented and this must be recognized and overcome. Recommendations are made to alleviate the existing difficulties to further interdisciplinary research.

● DuBridge, Lee A.

The Role of Government in Science Education

Bulletin of the California Institute of Technology, Volume LXXV, No. 1, 1-18, March, 1966.

In his statement given to a House Subcommittee, DuBridge's thesis stresses that it has been determined that the progress of pure and applied science in the United States is essential to the national interest and hence is a concern of the Federal government. DuBridge traces the historical development of this philosophy, the programs that have resulted and their impact upon colleges and universities during the last 20 years. Noting that achievements outweigh the problems, six recommendations are offered to relieve or alleviate the latter. Most of these relate to strengthening graduate research and education, with the NSF expanded as the major supporter of basic research and graduate education recommended.

- Federal Council for Science and Technology. Committee on Federal Laboratories

  Education and the Federal Laboratories

  U. S. Government Printing Office. Washington, D. C. March, 1968.

  This report was prepared by the Committee on Federal Laboratories, chaired by Allen V. Astin, from a study conducted during 1966-67. The conclusions reached were that the maintenance of a high level of competence and effectiveness in the Federal laboratories requires a strong program for continuing education and professional development of the technical staffs of the laboratories, probably best achieved by cooperative arrangements with available universities. To meet these objectives, nine recommendations were suggested by the study including convening a symposium in Washington, D. C. to discuss the report, and to further government-university relations and cooperation.

- Handler, Philip

  Toward a National Science Policy

  Statement before the Subcommittee on Science, Research, and Development, Committee on Science and Astronautics, House of Representatives, Congress of the United States, Washington, D. C., July 21, 1970.

  Handler cites cogent reasons why it is propitious for a searching inquiry into the Federal-Science relationship. Although his testimony is wide-ranging, he focuses on several key areas and recommendations: a National Youth Service Program which would provide financial support for all graduate students in return for two to five years service from the supported students, reform of graduate education with most students receiving an intensive nonresearch based doctorate and the Ph.D. being reserved for those intending to pursue life-long careers in scholarly investigation, creation of a new relatively large agency for higher education and research with NSF as its cornerstone, a large scale program of formula grants to institutions in addition to individual research grants, opposition to any wholesale reorganization of universities to permit multidisciplinary attacks on the environment or other current problems, support of all competent research that is possible, and a clear Federal commitment to and a Federal policy for a long-range stable program of support for science.

- Harris, Seymour E., editor

  Education and Public Policy

  McCutchan Publishing Corporation. Berkeley. 1965.

  This volume is the third in a series based on seminars given at Harvard in 1962-63 and consists of papers and discussions centering around 16 topics prepared by many experts and summarized under four major headings: "Political Issues," "Qualitative Issues," "Economic Issues--The Cost of Education," and "Economic Issues--Government and Education." In the introduction, Harris

summarizes the important points of the papers and discussions, and although pertinent to some aspects, most of the discussion is only indirectly related to graduate education.

- Higher Education and National Affairs

House Education Panel Hears Kerr's Views on Education Needs

Higher Education and National Affairs, Volume XIX, No. 9, 7-8, March 6, 1970.

This article recaps Kerr's testimony, expresses his views on the needs of higher education, and presents to the Subcommittee the Carnegie Commission's original report of March 2, 1968 and 12 pages of revisions his panel made in 1970. He recommends equality of educational opportunity, expansion of community colleges and urban four-year colleges, expansion of medical and dental schools, creation of a federally funded National Foundation for the Development of Higher Education to encourage new experimental programs, and recommends support of graduate education and research at present levels but foresees no need for expansion. Kerr supports the D.A. degree to answer the criticism of too much specialization in the Ph.D. The report discusses research grants, cost of living allowances and construction grants. Kerr recommends the need of a cabinet level Secretary of Education, predicts 14,000,000 full-time equivalent students by year 2000, and that 2/3's of the costs will be paid by the Federal government because it will receive 2/3's of the taxes. Education is a national, not a local interest.

- National Research Council. Office of Scientific Personnel

Report on the Conference on Predoctoral Education in the United States

National Research Council. Washington, D. C. November, 1969.

This report makes recommendations for the creation of a National Board on Graduate Education representative of and responsive to the interest groups involved: the academic community, industry, Federal agencies and the legislative and executive branches of government, foundations and associations, disadvantaged groups and the public. The purpose of this Board is to carry out an integrated national effort to meet the critical needs and changes in graduate education in the future. The functions of the Board would be to: establish general policy, identify problems, undertake and conduct studies, review reports of studies, arrange for publication of reports, and carry out the implementation of the recommendations. Suggested studies would deal with all traditional disciplines as well as the newer interdisciplinary and transdisciplinary fields and with all "research-based" degree programs beyond the baccalaureate, with the exception of law and medicine.

- National Science Foundation. National Science Board. Philip Handler, chairman

Toward a Public Policy for Graduate Education in the Sciences

U. S. Government Printing Office. Washington, D. C. 1969.

Overall, the report notes that the great strength attained in science and engineering in the United States has been developed without the guidance of an explicit national policy; forecasts that in the next decade graduate education will be the fastest growing element in the educational process; its costs will quadruple by 1980, and that additional Federal funding will be required for institutions if they are to meet the expectations of American society. Although the report focuses primarily on graduate education in the sciences and engineering, its findings could be applied to the arts and humanities. The Board reviews the roles of educational institutions, state and regional planning, and the Federal government; assesses needs; and makes recommendations for the future. It concludes that the paramount obligation of the educational institutions is maintenance of quality programs of education and research and the development of new multidisciplinary graduate programs in strong academic departments already in existence; that state and regional groups should exert strong control of selective expansion of graduate education with emphasis upon strengthening existing programs and institutions, establishing only new high quality urban and regional graduate centers to meet population and geographic distribution needs; that Federal funding is especially critical at the graduate level--this should supplement not replace non-Federal sources--and that the Federal mechanism of support must be restructured to meet the major expansion expected in the next ten years. To accomplish the latter, six types of Federal grant programs, all but the first awarded on the basis of appropriate national competition, are proposed: institutional sustaining grants, departmental sustaining grants, developmental grants, graduate facilities grants, graduate fellowships, and research project grants.

- President's Commission on Campus Unrest. William W. Scranton, chairman

The Report of the President's Commission on Campus Unrest

U. S. Government Printing Office. Washington, D. C. 1970.

This report follows the incidents at Kent State University and Jackson State College and investigates campus unrest throughout the nation. The term campus unrest can include peaceful dissent and violent disorder, each of which must be dealt with differently. The report makes various recommendations to the President, government, law enforcement agencies, universities and students based on these underlying themes: extremists and agitators are a small minority of the campus population; dissent and peaceful protest are essential to democracy and must be protected, but violence cannot be tolerated; student activism results from unresolved national questions (war, the race issue, etc.) and from defects in universities; actions of students, police, government, political leaders and the university itself have contributed to dissent; all Americans

must act to prevent violence, create understanding, and reduce bitterness and hostility with respect for law and tolerance of dissent.

- Report of the President's Task Force on Science Policy

  Science and Technology: Tools for Progress

  U. S. Government Printing Office. Washington, D. C. April, 1970.

  Appointed by President Nixon and chaired by Reuben F. Mettler, the Task Force focused on seven primary urgent problems that could be undertaken in the immediate future but which would have a long-term impact. Section 1 described the need for high quality science relevant to our national needs and goals, Section 2 suggested more effective government leadership in utilizing scientific advances in a broad scale attack on urgent societal problems, Section 3 highlighted better Federal management and support of basic and applied science research with an improved process of establishing priorities, Section 4 called for stimulating private institutions and organizations to apply their resources and capabilities to solution of societal problems, Section 5 recommended that the President enunciate a national policy of increased emphasis on R & D for national security purposes, Section 6 stressed initiating international programs utilizing scientific and technological capabilities to further cooperation, and Section 7 called for a continuing development of a national science policy on a long-range basis.

- Seaborg, Glenn T.

  The Government-University Partnership in Graduate Education

  Proceedings of the Eighth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. San Francisco. 28-46. December, 1968.

  Seaborg provides a broad description of the relationship of the university and the government in which he traces the history of Federal aid to education up to the present and then makes predictions about the future. The relationship is a permanent and a growing one; he predicts that Federal support will be 1/3 to 1/2 of universities' budget needs by 1975. There is a need for a higher level coordinating body, perhaps at the cabinet level, to provide greater cooperation on the part of the government and the institutions to bring about stability in financing and cooperation in sharing facilities and resources. The university must protect its autonomy so that the prime reason for its existence, fostering excellence in knowledge and teaching the young, will be maintained. Graduate schools will have the key role for "total living" of all citizens in the future.

- U. S. Congress. House. Committee on Science and Astronautics. Subcommittee on Science, Research, and Development

  National Science Foundation: Its Present and Future

  U. S. Government Printing Office. Washington, D. C. 1966.

  This report of hearings of the Subcommittee on Science, Research, and Development criticizes the National Science Foundation as being too passive and inadequately organized to serve present and future needs in view of its exclusive scientific mandate. Various recommendations are made for upgrading NSF and increasing its influence: NSF should evaluate the needs of the scientific community and channel effort into promising areas of the social sciences; the functioning of the National Science Board should be streamlined; the prestige of the Foundation's Director should be enhanced, and his salary increased; the Director should be empowered to pass on all proposals for NSF support subject to Board restraint only in exceptional cases, and to delegate some decision-making functions as he deems appropriate; more high-level staff with managerial as well as scientific experience should be hired. Legislation which may be needed is recommended and discussed.

- U. S. Congress. House. U. S. Advisory Commission on International Educational and Cultural Affairs

  Sixth Annual Report of the U. S. Advisory Commission on International Educational and Cultural Affairs

  U. S. Government Printing Office. Washington, D. C. 1969.

  The Commission reviews the background, problems, needs, and role of the Federal Government in improving international educational and cultural affairs. Key recommendations made were: the President should stress that international educational and cultural programs are a vital part of U. S. foreign relations and establish an organizational structure within the Executive Branch to assure consistent and purposeful national action along these lines; younger people are needed to administer the program under an agency separate from the State Department which would consolidate the Fulbright Program, the Peace Corps, and USIA; the Fulbright Program, divorced from CIA activities, should be expanded and financially supported. The Commission endorses the value of the Government Advisory Committee on International Book and Library Programs.

- U. S. Department of Health, Education, and Welfare. Office of the Assistant Secretary for Planning and Evaluation

  Toward a Long-Range Plan for Federal Financial Support for Higher Education

  A Report to the President. U. S. Government Printing Office. Washington, D. C. January, 1969.

  Known as the Rivlin Report, this publication summarized the HEW Committee's recommendations to the President under four major headings with estimated

costs. These were: improving equality of opportunity by a major expansion of Federal grants to needy and middle income students; fuller funding of Title III of HEA of 1965 (Developing Institutions Program and Special Services for Disadvantaged Students); providing loans to students to supplement grants and a national student loan bank; improving the quality of higher education by increasing funds to institutions; improving graduate education and research by expanding fellowship funds, institutional grants, and unrestricted grants for teaching and research; and encouraging wise use of resources by institutions. The program recommended would grow to $6.3 billion per year in additional funds by FY 1976 with the highest item of priority for expanded grants for needy students costing about $4 billion of the total. It is concluded that graduate education is a national resource and the Federal government should finance a larger proportion of the costs than it does in any other major sector of our educational system. The NDEA fellowship program should be increased to support 30,000 students by 1975 with the cost-of-education allowance raised to $5,000/fellow with future adjustments as necessary.

- U. S. President's Science Advisory Committee. James R. Killian, chairman

Strengthening American Science

A Report to the President. U. S. Government Printing Office. Washington, D. C. 1958.

The report suggests the need of a coordinating body, to be known as the Federal Council for Science and Technology. Its chairman would be a special assistant to the President, and the council would be representative of all governmental agencies involved in science and technology. The purpose of the recommended Advisory Committee would be to perpetuate the merits of the existing programs, to plan new functions and programs with an adequate base of support, and to set priorities for programs and funding.

- The White House. President's Science Advisory Committee

Scientific Progress, the Universities, and the Federal Government

U. S. Government Printing Office. Washington, D. C. November 15, 1960.

Known as the Seaborg Committee Report, and done at the beginning of large-scale Federal support of basic research and graduate education, the recommendations made have subsequently exerted a profound influence on Federal programs and funding for science. The three-part statement first defined the general problem, reached 16 specific conclusions, and made both general and specific recommendations for both universities and the Federal government in the expansion and support of science in the future. Overall, the case was made that scientific progress is unpredictable but essential to the health of the nation; basic research and graduate education are inseparable and closely related to applied research; research, learning and teaching are deeply related processes at the graduate level; and the Federal government has primary responsibility for the quality of basic research and graduate education.

- Wilson, Logan

  Basic Premises for a National Policy in Higher Education

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 263-271. 1965.

  Wilson discusses eight basic guidelines which should precede national policy formation: a stronger and more viable system of higher education is essential to the national welfare, the need to expand and improve American higher education is urgent, expansion and improvement should have national policy guidance, national policy and Federal policy need not be one and the same, a realistic assessment of existing strengths and weaknesses is overdue, higher education will be financed adequately only where costs are regarded as investments rather than expenditures, the disjointed organization of higher education must be unified, and the efficiency of freedom should be safeguarded.

- Wilson, Logan

  A Better Partnership for the Federal Government and Higher Education

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 272-281. 1965.

  Wilson gives his six-point plan of attack for evolving a national policy for higher education based on: the national interest principle for endeavors which other sectors cannot support, the human resource development principle, the selective principle of financing, the complementary principle where Federal funds are incentive for other support, the merit principle based on quality, and the coordinated plan principle to eliminate duplication and wasteful competition.

- York, Carl M.

  Steps toward a National Policy for Academic Science

  Science, Volume CLXXII, No. 3984, 643-648, May 14, 1971.

  In a general discussion of a national policy for academic science, York proposes two steps: the first suggests a budgetary policy that would stabilize the total amount of Federal money made available to universities and colleges for R & D, and the second deals with the level of direct support for graduate students in science and engineering. He states that almost 2/3's of the Federal government's support for scientific research goes to institutions of higher education: in 1960 Federal R & D obligations were $458.6 million, this rose to $1525.8 million in 1969 and is estimated at $1464.3 and $1570.7 millions in 1970 and 1971, respectively. York reviews three methods that have been proposed for Federal support of academic science (DuBridge method, Fubini method, and Price method) and shows that although they differ in approach, the current dollars that would be provided by each method from FY 1971 to FY 1974 do not vary significantly. It is pointed out that most projections on the production of advanced

degrees ignore the influence of the declining national birthrate; but assuming that the collegiate undergraduate enrollment is limited to 50% of the population, the number of Ph.D.'s to be awarded can be predicted at about 229,600 from 1968 to 1980. A number of projections on the job market for Ph.D.'s in 1980 have been made; in spite of the general agreement that there will be an excess if present trends continue, openings in physics, chemistry, and to some extent, engineering will have shortages over the next decade according to Bureau of Labor statistics projections. It is difficult to argue that students should not be supported now because of the temporary unemployment of scientists and engineers since these students will not be entering the job market until the end of this decade. Therefore, it is unwise to reduce significantly the technical manpower that will be available at the end of the 1970's and it would be better to maintain graduate student support at some predetermined level for the next several years.

PLANNING, FINANCING, COORDINATION, PRIORITIES

- Axt, Richard G.

  Research on Graduate Education: Report of a Conference held at the Brookings Institution on February 27, 1959

  Brookings Institution. Washington, D. C. 1959.

  Condensed in this report are the discussions from a 1959 conference attended by government officials, educators and university administrators whose purpose was to investigate research on graduate education and to determine those areas in which further research was needed. At that time, private and Federal funds were increasing for fellowship and other graduate support and the lack of accurate data on graduate education was considered a large problem--society's needs and demands were increasing and it was necessary to determine if quality was being sacrificed for quantity in graduate education. Areas recommended for expanded research were: graduate support and employment data, costs of expansion by field, qualitative study on graduate education, impact of Federal aid, future needs for manpower by field, and new research methods.

- The Carnegie Commission on Higher Education

  From Isolation to Mainstream: Problems of the Colleges Founded for Negroes

  McGraw-Hill Book Company for the Carnegie Commission on Higher Education. New York. February, 1971.

  This report discusses black colleges, their successes and failures, and problems; recommendations for how these institutions can be financially aided and improved to meet goals for 1980 are offered. The study concludes that enrollment in the Negro colleges should double in the coming decade, faculty salaries and curricula should be put on a par with white institutions, a Federal agency should be established to aid Negro colleges in planning and funding needed developments, institutional cooperation should be encouraged, and black

colleges should be encouraged and aided in solving their special problems to bring them into the mainstream of American higher education.

- Distler, Theodore A.

  Problems of the Washington Secretariat

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 255-256. 1965.

  To answer the necessity of coordinating national educational associations the author suggests the following needs be provided for: the need of a plan of organization to be a voice for higher education to Congress and Federal agencies; the need for better public relations--need for one journal that would speak to the lay person; and the need for a Congress of Higher Education to meet with representatives of all associations every four years to replace the annual meeting of individual organizations.

- Fidler, William P.

  Problems of the Professional Associations and Learned Societies

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 250-254. 1965.

  Author suggests that one way of coordinating the many educational associations and learned societies is by having them meet ad hoc to treat, one at a time, a given problem of interest to all.

- Harcleroad, Fred F., editor

  Issues of the Seventies: The Future of Higher Education

  Jossey-Bass, Inc., Publishers. San Francisco. 1970.

  This is a collection of essays presented at the Educational Conference of the American College Testing Program in May, 1969. Critical views and recommendations in the areas of decision making in the 1970's are presented and summarized in a prologue by the editor, in 11 chapters by various contributors, and in an epilogue by Ralph Tyler. The major topics center around three questions of fundamental importance to higher education: society's concerns (credibility of institutions, equality and accessibility to education for all, and flexibility in admissions and programs to meet human needs); student's needs (participation in governance, changes in programs, and better guidance and instruction leading to a higher rate of successful completion); and institutional response to society's and student's concerns (public confidence and support so institutions can manage their affairs better and freely, better use of resources, and more stress on better teaching to overcome impersonalism and mechanization).

● Magoun, H. W.

Geographic and Institutional Aspects of Graduate Education and Research

Graduate Division, University of California, Los Angeles. 1970. (Mimeographed.)

As a contribution to the Festschrift to Gustave Arlt to be published by the Western Association of Graduate Schools, this paper reviews some geographic, national and institutional factors illustrative of the "geography of concentration," that are likely to influence future developments in graduate education in the United States in the coming decades. The main conclusion is that population and income, graduate education, the 50 leading institutions, resources, and productivity are mainly concentrated in ten states and these factors should be considered in planning future graduate education and research in the United States.

● President's Science Advisory Committee. Panel on Educational Innovation

Educational Opportunity Bank

U. S. Government Printing Office. Washington, D. C. 1967.

The panel recommends establishment of an Opportunity Bank as an agency of the Federal government authorized to borrow money at going government rates, and to lend this money to postsecondary students regardless of the student's resources. The bank would recoup these loans through annual payments collected in conjunction with the borrower's future income tax and pledged as a part of his future income for a fixed number of years (30 to 40 years) after graduation. Estimates are that the Bank could be self-sustaining if it charged borrowers 1% of gross income over 30 years for each $3,000 borrowed. The advantages and objectives of the proposed plan are discussed.

● Sullivan, Richard H.

Speculations about Graduate Education

Proceedings of the Seventh Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 38-44. December, 1967.

In the keynote address to the Seventh Annual Meeting of the Council of Graduate Schools, Sullivan reviews the current problems facing graduate education in a period of stress. The impact of the war in Viet Nam is causing serious questioning of the moral values of the Nation and the universities among students. The practical effects of the war--such as the draft, cuts in Federal funding to graduate education and reduced funding for research grants--are producing a loss of able students, with only partial recapture of them at a later date. The author sees a need for the academic community to plan for the future, determine its goals, and develop a national policy for higher education in order to avoid relinquishing all responsibility to the Administration and Congress.

- Wilson, Logan

  Form and Function in American Higher Education

  Emerging Patterns in American Higher Education. Logan Wilson, editor. American Council on Education. Washington, D. C. 29-37. 1965.

  Wilson feels, in light of the great demand to be made upon higher education by 1980, that institutions will have to undertake self-evaluation to meet the challenges, and that after starting at the university and college level, there will have to be more voluntary cooperation and coordination at the state, regional and national levels.

PURPOSE, GOALS, REFORMS AND CHANGES

- American Society for Engineering Education. The Goals Committee

  Final Report: Goals of Engineering Education

  American Society for Engineering Education. Washington, D. C. January, 1968.

  This report is a study of data gathered from engineering educators, practicing engineers, and employers of engineers. The study was an attempt to indicate the direction engineering education must take to meet the demands of the future. There has been a strong tendency to broaden the branches of engineering and to consider the master's degree as the basic professional degree. It is estimated that in 1978 two out of three bachelor degree graduates will go on to a master's, and one in seven will complete a doctorate. The Goals Committee recommends the trend toward advanced education and the maintaining of high standards in the many new engineering schools. The small group in research is growing and the need for college teachers in engineering will continue with a very high percentage holding a doctorate. It is recommended that colleges take advantage of the employees and facilities in nearby industry and government agencies, and that arrangements be devised for extending high-quality advanced degree education to students remote from established campuses.

- Arlt, Gustave O.

  Graduate Education Today

  Proceedings of the Second Summer Workshop for Graduate Deans. Council of Graduate Schools in the United States. Lake Arrowhead, California. 1-4. July, 1969.

  This paper, from a 1969 Summer Workshop, deals with graduate school problems--including finances, public opinion, and faculty apathy to all the problems facing the schools. Arlt contends that the entire graduate system must change, but the main obstacle is the faculty. He highlights the concerns leading to the Woods Hole Conference sponsored by NAS as central to all of the topics to be discussed at the Workshop.

● Arlt, Gustave O.

Quo Vadis?

Paper presented at the Thirteenth Annual Meeting of Western Association of Graduate Schools, Newport Beach, California, March, 1971.

Arlt re-emphasizes and extends, in this paper, his thesis of two years ago that higher education is in need of thorough reform; eight reasons for this reform and 15 recommendations to achieve the needed changes are presented. The recommended changes are: reduce required time by 1/4 to achieve an undergraduate education; accredit high schools so they may include the equivalent of the first year of college work; offer an option for deferred college attendance to prospective college students; redesign structure of degree programs so a stopping place may occur every two years; make available new and more liberal forms of access to higher education; expand work-study program opportunities; make various alternatives to formal college education available; provide state and Federal assistance to those enrolled in formal and informal educational endeavors; make access to college and vocational education easier for minorities and underprivileged; adopt an intermediate degree between the master's and doctorate levels; adopt the D.A. as the standard degree for those who will be primarily teachers in colleges and universities; reserve the Ph.D. for those who will make careers of original research; minimize or eliminate the existing arbitrary dividing line between preparation for and practice of a profession; provide opportunities at all levels for life-long education in the universities; and, use something other than the counting of credit hours as the determinant for educational progress and completion.

● Bonner, James

Graduate School: The Basis of Our Technical Culture

A lecture delivered as part of the Advancement of Learning series. The University of Utah. Salt Lake City, Utah. 3-9. February 20, 1961.

The graduate school is defined and analyzed as an institution by examining its roles and functions in society and its future in our culture. It is viewed as an apprenticeship in creative, unorthodox problem solving and as the principal source of new basic insight and wisdom critically vital to society's welfare and culture; graduate schools not only educate people to solve problems, but they solve problems in the process. Graduate school brings together the critical mass of minds--the graduate students, the postdoctorals and the professors--interested in focusing upon the same problems in a creative way. It is successful because of the turnover of the neural network which is in constant flux and because it is dedicated to non-mission orientedness. The graduate school can and must be improved by studying itself and its processes and, particularly, by better understanding the cerebral processes, creativeness and learning.

● Bowen, Howard R.

The University in America: 2000 A.D.

Washington State Review, Volume XI, No. 4, 3-7, Summer, 1968.

Bowen describes his views of the major functions of the future university in America with the major theme that the university should maintain its freedom and independence while responding to the needs of society; the final decision on how it can best serve should be made by the university itself. The major recommendations emphasize that a liberal university should concentrate on upperclassmen, graduate and professional students; a basic research program as opposed to applied research should be stressed; consulting and service functions should be limited; the university should not become a center for action but remain a place for thought and discussion; it should strengthen its role as a patron of the arts; it should strive to influence community life rather than to control it; and it should have an active role in the formation of values and social goals.

● Brennan, Michael J.

A Cannibalistic View of Graduate Education

Proceedings of the Ninth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Washington, D. C. 25-34. December, 1969.

Brennan focuses his exposition basically around responses of graduate deans whose concern centered around four major topics: teacher preparation, relevance of doctoral education, disadvantaged students, and the university and society. Financing as a fifth issue is treated as pervading all discussions of academic issues. Brennan singles out the first and last topics for major emphasis in his paper and treats each in elegant perspective. His conclusions are that the graduate establishment is basically conservative and that there is evidence that this extreme conservatism has impeded worthy innovation; examples of this are cited. The crucial question is whether graduate schools and faculties can handle their own affairs or whether society will solicit change with the temptation of dollars.

● Caffrey, John

Predictions for Higher Education in the 1970's

The Future Academic Community: Continuity and Change. John Caffrey, editor. American Council on Education. Washington, D. C. 261-292. 1969.

The paper is based on results of a survey involving the "probability" and "desirability" of 35 hypothetical events, conditions, or developments in the decade 1968-78. Opinions and ratings were solicited from five groups to

reflect concerns with the following issues or problems: the nature and distribution of student population, Federal and other financial support, curriculum and instruction, graduate output and distribution, modes of internal governance, general structure of higher education, and socio-economic factors. Results, summarized in tables, are discussed.

- The Carnegie Commission on Higher Education

  Less Time, More Options: Education beyond the High School

  A Special Report and Recommendations by The Carnegie Commission on Higher Education. McGraw-Hill Book Company. New York. 1971.

  This special report of the Carnegie Commission on Higher Education is focused on increasing the options available and reducing the time and expenses of individuals in receiving a higher education. It consists of a foreward, eight chapters, five appendices, and three tables. An innovative plan for progressive stages of education, with definite "step-out" intervals between one stage to the next possible, and with each interval marked by the achievement of degree step, i.e., A.A., B.A., M.A., M.Phil., D.A., Ph.D., or M.D., is recommended. All stages of the continuing education plan would be shortened for the advanced degrees, Ph.D. and M.D.; entry, re-entry and/or redirection, would be possible after intervals of work, child rearing, etc. without penalty. The responsibilities of all sectors concerned are defined and a list of goals for implementing the recommendations by 1980 are given.

- Cartter, Allan M.

  Graduate Education in a Decade of Radical Change

  Changing Patterns in Graduate Education. Highlights from papers presented at CRDHE's Conference on Higher Education, St. Louis, October, 1970. The Center for Research and Development in Higher Education. Berkeley. 18-20. 1970.

  Cartter reiterates much he has previously predicted: namely that the 1970's will witness budgetary constraints because both the traditional and new external sources of support will decline; there will be an oversupply of Ph.D.'s since the demand for new faculty depends on replacement, expansion and improvement--the first remains relatively constant and the third is largely tied to the other two. The predicted expansion will not occur and hence need for new college teachers will decline. Key recommendations, among several offered, are: newly developing institutions must be restrained voluntarily or by stricter external controls; Federal government should designate and support only about 75 "National Universities"; and recession may foster innovation, enforced reevaluation and revitalization of graduate education.

- The Chronicle of Higher Education

  A Model Bill of Rights and Responsibilities for Members of an Institution of Higher Education: Faculty, Students, Administrators, Staff, and Trustees

  The Chronicle of Higher Education, Volume V, No. 23, 1, 11-14, March 15, 1971.

  This article reports the results of a task force initiated by the Department of Health, Education, and Welfare and financed by the Ford Foundation for the purpose of examining the current national system of higher education. The Commission, highly critical of the present system, found that in essence higher education needs reform of an innovative nature. Among its recommendations are: the changing of the classroom from the traditional lecture/reading format; the changing of admissions policies to allow students to drop in and out of college more easily; the expansion of opportunities for higher education by use of regional examining universities, which give exams and grant degrees but offer no courses; the use of regional television colleges; and a reversal from the trend toward massive centralized state systems and the encouragement of good community colleges. Apprenticeships and part-time work programs should be expanded and the institutions should adapt to the minority student not he to it, equal rights for women students and faculty members are urged, and making continuing education a vital part of the university is advocated. The report concludes that in order to regain positive public support, higher education must break free from the conventional wisdom and examine itself critically. Many educational organizations and individuals have criticized this report severely.

- Curle, Adam

  Universities in a Changing World: Innovation and Stagnation

  The New University. John Lawlor, editor. Columbia University Press. New York. 1-24. 1968.

  Curle looks at the status and purported stagnation of universities in different parts of the world and recommends that innovation be initiated in order that education will serve society and be a force for change. He uses India and much of Africa to illustrate a transplanted British educational system emphasizing humanities--not the necessary technical fields. In Latin American universities, there is too much student involvement and not enough guidance. The resulting shortages of skilled labor cannot be filled by the developed nations. To provide the capability to cope with the future, he recommends that the university encourage creativity and diverse abilities, stress structure instead of facts, and cooperate with industry. He views the purpose of the university as being the force to fuse academic traditions with the "real" world--business, industry and government.

● Gardner, John W.

Self-Renewal: The Individual and the Innovative Society

Harper Colophon Books, Harper & Row, Publishers, Inc. New York. 1965.

Gardner's essay depicts his philosophy about the renewal of our spirit in society today. What we need, he says, is a renewal of government, education, and all other affairs of man in our minds and hearts--unless we have this renewal all the social arrangements in the world will not help. Education for renewal is to a considerable degree education for diversity, and although specialization is necessary, there is no reason why the individual cannot also be a generalist. Education should give a broad and firm base for a lifetime of learning and growth which nourishes the desire to want to continue to learn.

● Glenny, Lyman A.

Doctoral Planning for the Seventies: A Challenge to the States

Proceedings Annual Meeting of the Southern Regional Education Board. Houston, Texas. June, 1970.

This is an excellent and comprehensive review of the events, largely starting in the 1950's, that have now culminated in the current crisis; the major problems that undergird the wise planning needed for graduate education in the 1970's are discussed. Glenny sees five grave problems facing the public and private institutions in the United States: underwriting the financial requirement, reducing anticipated surplus production, maintaining the quality of the doctorate, changing the character of some doctoral degree training, and absorbing the surplus doctorate degree holders. After discussing the major events contributing to the present situation, the major problems with suggested solutions are developed and discussed in detail.

● Hart, Floyd H.

Can the Restless Campus Be Cooled? How?

Report of a Legislative Work Conference on Higher Education. Robert H. Kroepsch and Dorothy P. Buck, editors. Western Interstate Commission for Higher Education. Boulder, Colorado. 53-54. February, 1970.

Two major points are made: we should listen to what all segments of society are conveying about the faults of the educational system, particularly to the message from students; and we must convince the students and faculty involved in violence today that we also want changes made, but within the system, not by destroying it.

● Heiss, Ann M.

Challenges to Graduate Schools

Jossey-Bass, Inc., Publishers. San Francisco. 1970.

This is an assessment of the Ph.D. today which was based on: a review of the literature (mostly critical in nature); a review and critique of ten prestigious graduate schools (Berkeley, Columbia, Cornell, Illinois, Johns Hopkins, Michigan, North Carolina, Northwestern, Stanford, and Wisconsin)--three departments from each of the schools' four broad areas of humanities, social sciences, biological sciences and the physical sciences; and data obtained from a faculty questionnaire and a doctoral student questionnaire (the Omnibus Attitude Inventory). As a result of her study, Heiss distills and suggests 29 recommendations for changes leading to reform in graduate education assuming certain basic tenable premises. These cover the wide gamut of graduate study from goals and objectives, curricula, programs, instruction, research, organization, and administration, to national policy.

● Heyns, Roger W.

The Academic Community

The Graduate Journal, Volume VIII, No. 1, 9-20, 1968.

Heyns discusses the lack of a common view of the basic nature and purpose of a university and proposes that this has created tension and division within the academic community and between the universities and society. He decries the current manner and inadequacy of making decisions and proposes a new view that would be beneficial to governing boards, to faculty and students, and to society. His proposal involves the university as a center of learning in which the administration, faculty and students interact as partners, rather than power blocks, with the emphasis upon activity to bring about needed changes. Mutual respect and faith are necessary for effective action; the role of the university is seen not as an instrument for direct social action, but as one to prepare students for responsible social activity wherein the educational experience is relevant to life.

● Lester, Charles T.

The Future Content of Graduate Education

Proceedings Twelfth Annual Meeting. Western Association of Graduate Schools. Seattle. 58-61. March, 1970.

Lester reviews the events of the past five years and, from his experience and contacts as chief of the Graduate Academic Programs Branch (Title IV Program) of OE, predicts what the future content and nature of graduate education are likely to be: tremendous increases in graduate programs in environment, conservation, urban planning, and ecology--most will be multidisciplinary in scope and will require a reordering of priorities and support funds; fewer

students will be supported by research grants from certain agencies. Additional predictions made by Lester were: further individualization of graduate programs and proliferation of work-study and internship programs will lead to a decrease in support for traditional full-time graduate study; students will have more input as to content and will be more involved in planning and policy decisions in graduate education; more interdisciplinary seminars and formal courses will be developed in the future to educate persons with broad perspectives to cope with societal problems and programs; and the dissertation will become more varied in form, content, length and purpose--in some cases it will disappear or be replaced by other options. He concludes that graduate schools face a choice in flexibility of programs or loss of students, and that future changes will be tempered by austerity rather than by affluence.

- Mayhew, Lewis

Graduate and Professional Education

Changing Patterns in Graduate Education. Highlights from papers presented at CRDHE's Conference on Higher Education, St. Louis, October, 1970. The Center for Research and Development in Higher Education. Berkeley. 24-27. 1970.

Mayhew criticizes the suggestions made in other papers given at the Conference as untenable, idealistic, and probably at present unobtainable. He concludes that: higher education has low priority compared to other state matters; plans for 100,000 Ph.D.'s and 400,000 master's per year by 1980 are questionable as to need or attainability; pace-setting institutions have become the models; and graduate education needs a new framework. Some suggestions for improvement are given: set 1977 as the target date for planning, end "big science" on the campus, reorder priorities to upgrade teaching and service, and organize institutional conferences to address problems pertinent to each campus.

- Millard, Richard M.

The Campus Is Restless: Can It Be Cooled? How?

Report of a Legislative Work Conference on Higher Education. Robert H. Kroepsch and Dorothy P. Buck, editors. Western Interstate Commission for Higher Education. Boulder, Colorado. 54-58. February, 1970.

Higher education enrollments have increased 100% from 1960 to 1968 and, according to Sidney Tickton, college enrollments will be about 12 million students by 1980. Expenditures were $5.6 billion from 1959-60 and increased to $18.7 billion in 1968-69. Higher education has become everybody's business and everyone wants a part in it. There is a need to reaffirm and clarify our goals in national education, and the need is for differentiation in education--post-secondary and college--not just college.

- Muscatine, Charles, editor

  Education at Berkeley: Report of the University of California, Berkeley, Select Committee on Education

  University of California Press. Berkeley. 1968.

  To guide needed innovations and change, the Select Committee on Education submitted 42 proposals and specific recommendations regarding students; teaching; admission, orientation and advising; class size; grading; education development and innovation; new programs; undergraduate requirements; graduate education (in part centering around Ann Heiss' study); and problems facing the teaching assistant. The majority report, usually known as the "Muscatine Report," has been adopted in part, but the Graduate Council approved the candidate's degree in place of the recommended Doctor of Arts. The minority report by Professor George Pimentel was also submitted and is included.

- Nason, John W.

  American Higher Education in 1980--Some Basic Issues

  Man in 1980 Paper No. 1. Aspen Institute for Humanistic Studies. Aspen. July, 1965.

  John Nason, in this paper, has summarized his interpretation of the meeting held at the Aspen Institute for Humanistic Studies--"Man in 1980"--involving college and university presidents. The wide-ranging discussions cover such problems as: size and diversity, the problems and definition of an academic community, clarification of purpose, modernizing the curriculum, faculty problems, the role of the president and autonomy of the university, the student enigma, and the moral obligation of the university. The succinct "take home" summary was: much of what is taught is too great in quantity and too difficult in content for many of the students, and the author gives little credence to the cliche that "research and teaching go hand in hand."

- National Academy of Sciences. Committee on Science and Public Policy. Committee on Research in the Life Sciences. Philip Handler, chairman

  The Life Sciences

  National Academy of Sciences. Washington, D. C. 1970.

  This report of a 29-member committee study of the life sciences, chaired by Philip Handler, gives recommendations for the future study of and research in biology. The report originally recommended a $250 million per year increase in Federal support but was amended in 1970 with the knowledge of the serious cut-back in funds for science. The funds are presently 20% less than those required for needed goals; once this deficiency is eradicated, the life sciences would require only a 12-15%/year increment in research support. Because of the diversity of the life sciences, ordering of priorities within the area was not attempted other than general support for basic research and graduate education.

Of the 1967 funds spent for biology, the most (25%) went to biochemistry and molecular biology research. Basic research in molecular biology is urged as most needed so as to achieve ability to cope with mankind's major diseases. The report concluded that environmental problems will be attacked in relation to what the public is willing to support. Educational reforms for high school and undergraduate biology curricula are urged and standardization of Ph.D. programs suggested. The overabundance of technical writings in the field suggests the need for a vigorous look at editorial standards to improve the quality and reduce the quantity of papers and publications.

● Odegaard, Charles E.

The University: A Look Backward

Washington State Review, Volume XI, No. 4, 13-15, Summer, 1968.

Universities have been able to survive throughout history because they have been able to adjust to changing times and circumstances. Their function as unique institutions will enable them in the future to give advice to those who seek it; however, some restraints upon what kind of advice and to whom this is given should be exercised. As much as money, the universities need moral support from the community and the nation.

● Rosenhaupt, Hans

Graduate Education

American Education Today. Edited from the Saturday Review's Education Supplement by Paul Woodring and John Scanlon. McGraw-Hill Book Company. New York. 1960.

This is a wide-ranging review, largely critical, of graduate education and the ills that beset it. Rosenhaupt sees graduate education as conservative, smug and complacent; and although in the main productive, it resists pressures and needed changes and will continue to do so until graduate professors are motivated to do otherwise.

● Scully, Malcolm G.

Scholars Call for 'Rethinking' of Academic Goals

The Chronicle of Higher Education, Volume V, No. 15, 1, 4, January 18, 1971.

This first report of the American Academy of Arts and Sciences' Assembly on University Goals and Governance is concerned with reform and change in all aspects of higher education. Five councils performed the work of the Assembly during its first year and Meyerson and Graubard present 85 "theses" of the councils as one report with nine main themes. The subjects range from problems

of finances and issues of governance to problems of broadening the composition of both student bodies and faculties. Criticisms of doctorate programs and schools as to content, length, and purpose are made; broad solutions are suggested for the reforms called for by the Assembly.

- Weaver, Warren

A Great Age for Science

Alfred P. Sloan Foundation. New York. 1961.

Weaver's essay, one of 16 resulting from President Eisenhower's Commission on National Goals, discusses broad goals for science education: equal educational opportunity for all able individuals, introduction of science at an early age, regard for and recognition of the importance of teaching, development of science through Federal and other funding, reestablishment of the role of small universities and colleges in recruiting and training scientists, and establishment of national priorities in planning the nation's scientific development. Because today science is heavily involved in social and political problems and funded largely by Federal monies, citizens must have improved understandings of what it is, how it operates and the circumstances that make it prosper. Goals are defined as moving targets, not fixed points which we can attain and then relax; the 17 recommendations consider the most important major goals and then describe the more specific goals in order of decreasing priority. The essay concludes: the nation needs more highly trained scientists and must better utilize them, science teaching must be improved at all levels starting at an early age, and a better balance of support in both sources and uses of funds must be reached.

- Yegge, Robert B.

The Campus Is Restless and so Is the Rest of Society

Report of a Legislative Work Conference on Higher Education. Robert H. Kroepsch and Dorothy P. Buck, editors. Western Interstate Commission for Higher Education. Boulder, Colorado. 35-38. February, 1970.

The author discusses the effect of social changes, unrest caused by the changes, and the potential impact of changes upon the future. Students and universities will be more active in social and community affairs and life styles will change; however, universities will not approximate any monolithic model and individually they will have to assess and establish their own objectives and role.

A U T H O R I N D E X

- A -

Adkisson, Virgil W., 182
Alberty, R. A., 119
Alciatore, Robert T., 38
Alexander, W. Boyd, 62
Allen, Don Cameron, 91, 102
Alpert, Daniel, 116
Altbach, Philip G., 28, 63
American Association of State Colleges and Universities, 91
American Council of Learned Societies Devoted to Humanities, 103
American Council on Education, 127, 149, 160
American Council on Education, Commission on Federal Relations, 161
American Geological Institute, Committee on Manpower, 130
American Institute of Physics, 103
American Physical Society, Economic Concerns Committee, 130
American Society for Engineering Education, The Goals Committee, 198
Andersen, Charles J., 111, 155
Anderson, G. Lester, 170
Anderson, R. D., 131
Anderson, Robert C., 18
Ansell, Julian S., 56
Arlt, Gustave O., 5, 6, 19, 103, 179, 198, 199
Armytage, W. H. G., 7
Aronoff, Sam, 68
Association of American Universities, 185
Association of Graduate Schools in the Association of American Universities, 92
Astin, Alexander W., 39
Astin, Helen S., 142, 144, 145
Aurbach, Richard H., 119
Avorn, Jerry L., 28
Axelrod, Joseph, 28, 62
Axt, Richard G., 195

- B -

Babbidge, Homer D., Jr., 34, 149
Barnes, Andrew, 145
Barzun, Jacques, 1, 183
Baskin, Samuel, editor, 62
Bates, Ralph S., 19
Bayer, Alan E., 43, 142
Beach, Leonard, 46
Beisse, Frederic, 25
Benezet, Louis T., 59
Berelson, Bernard, 7, 8, 92
Berger, Alan S., 175
Bilorusky, John, 60
Bock, Robert M., 167
Boffey, Philip M., 131, 145
Bogard, Becky, 25
Bogue, Donald J., 141
Bohnenblust, H. Frederic, 20
Bonner, James, 199
Borman, Alvah K., 59
Boruch, Robert F., 43
Bowdoin College, 63
Bowen, Howard R., 176, 200
Bowers, Fredson, 93
Boyce, Joseph C., 164
Brandt, Thomas O., 167
Breneman, David W., 154
Brennan, Michael J., 200
Bridgman, Donald S., 120
Brode, Wallace R., 132
Browder, Robert P., 99
Brown, David G., 51
Brown, E. Richard, 29
Brown, Edmund G., 8
Bryant, James W., 120
Bullock, Henry Allen, 1
Burn, Barbara B., 63
Burns, Richard L., 75, 76
Bush, Douglas, 104
Butterfield, Victor L., 104

- C -

Caffrey, John, 200
Carlisle, Donald, 43
Carmichael, Oliver Cromwell, 93
Carnegie Commission on Higher Education, 185, 195, 201

Carnegie Foundation for the Advancement of Teaching, 127
Carnegie Quarterly, 94, 104
Cartter, Allan M., 8, 9, 120, 132, 141, 146, 154, 155, 201
Cass, James, 44
Chase, John L., 27, 173
Chemical and Engineering News, 127, 133, 146, 186
Christiansen, John R., 34
Chronicle of Higher Education, 167, 202
Cieboter, Frank J., 39
Clark, Jere W., editor, 81
Clark, Juanita S., editor, 81
Clark, Kenneth E., 27
Clark, Robert D., 56
Cohn, Victor, 186
College Entrance Examination Board, 44
Colligan, Francis J., 162
Commission on MIT Education, 179
Commission on the Humanities, 186
Committee on Physics and Society, 161
Committee on The Student in Higher Education, 29
Comptroller General of the United States, 161
Connor, James R., 39
Cooke, W. D., 64
Coons, Arthur Gardiner, 72
Coordinating Council for Higher Education, 94
Cordasco, Francesco, 10
Cordozier, V. R., 94
Corson, John J., 56
Council of Graduate Schools in the United States, 68, 92, 95
Crane, Andrew (Ivy Wall), 28
Crawford, Bryce L., Jr., 10, 69
Creager, Joan G., 121
Cronon, E. David, 104
Crowl, John A., 176, 177
Cunningham, D. E., 187
Curle, Adam, 202

- D -

Danforth News and Notes, 165
Daniels, Jack, 34
Davidson, Doug, 46
Dean, Donald S., 180
Dearing, Bruce, 10
Deitch, Kenneth M., editor, 65
Dennis, Lawrence E., editor, 105
Devane, William C., 2
Devenny, Joseph A., 99
Distler, Theodore A., 196
Doermann, Humphrey, 76
Dremuk, Richard D., 77
Dressel, Paul L., 69
Dubin, Robert, 25
DuBridge, Lee A., 187
Dundonald, James, 11
Dunham, E. Alden, 73
Dure, Leon S., 133
Duren, William L., 133
Dycus, Peggy, 46

- E -

Eckert, Ruth E., 38
Eckert, Ruth E., editor, 180
Eells, Walter C., 121
Egerton, John, 44, 73, 106
Elberg, Sanford S., 30, 96, 182
Elder, J. Petersen, 40, 106, 182
Enarson, Harold L., 30
Engineers Joint Council, Engineering Manpower Commission, 134
Engineers Joint Council, Inc., Engineering Research Committee, 134
England, J. Merton, 20
ETS Developments, 105
Eurich, Alvin C., 64

- F -

Fact-Finding Commission on Columbia Disturbances, 30
Falk, Charles E., 122, 168
Farrell, Robert L., 141, 155
Federal Council for Science and Technology, Committee on Federal Laboratories, 59, 188
Federal Interagency Committee on Education, 168
Federal Interagency Committee on Education, Student Support Study Group, 169
Feldmesser, Robert A., 11
Ferguson, Alan, 172
Ferriss, Abbott L., 12
Fey, John T., 60
Fidler, William P., 196

Firman, Peter A., 156
Fischer, John L., editor, 113
Flexner, Abraham, 2
Folger, John K., 86, 96, 129, 142
Frankel, Martin, 122
Freedman, Melvin B., (Search for Relevance), 28
Friedman, Robert (Ivy Wall), 28
Friedrich, Lawrence, 169
Frisbie, Bruce, 175
Froomkin, Joseph N., 142, 174
Furniss, W. Todd, 107

- G -

Gab, Del, 91
Gaff, Jerry G., 55, 60
Ganz, Aaron, 164
Gardner, John W., 80, 203
Garrison, Roger H., 51
Glass, John F., 31
Glass, Judith, 31
Glenny, Lyman A., 73, 203
Goodman, Seymour S., 156
Gordon, David M., 31
Gottlieb, David, 38
Graduate College News, 74
Graduate Record Examinations Board, 77
Graham, Jane, editor, 89
Graham, Patricia Albjerg, 52
Grambsch, Paul V., 86
Greeley, Andrew M., 65
Green, A. E. S., 107
Groesbeck, Byron L., 77
Gross, Edward, 86

- H -

Haggstrom, Gus W., 128
Hall, Wayne C., 135, 143
Hamelman, Paul W., 156
Handler, Philip, 180, 188
Handler, Philip, editor, 107
Hansing, F. D., 164
Harcleroad, Fred F., editor, 196
Harmon, Lindsey R., 121, 165
Harrar, J. George, 135
Harris, Seymour Edwin, 177
Harris, Seymour Edwin, editor, 65, 188
Harrison, Wilfrid, 65
Hart, Floyd H., 203
Hartley, John W., 158
Hartshorn, H. Hadley, 45
Harvey, Philip R., 89
Hatch, Winslow R., (Search for Relevance), 28
Hatchett, Stephen P., 172
Haworth, Leland J., 150
Heard, Alexander, 52
Hedges, Janice N., 125
Hefferlin, JB Lon, 66
Heim, Peggy, 25
Heimberger, Frederic, 74
Heiss, Ann M., 25, 31, 52, 53, 82, 204
Heist, Paul, 60
Heist, Paul, editor, 32
Hendricks, Thomas E., 156
Henle, Robert John, S.J., 87, 116
Henze, Robert E., 123
Hereford, Frank L., 70
Heyns, Roger W., 26, 204
Higham, John, 12
Higher Education and National Affairs, 147, 189
Hillgarth, J. N., 78
Hirschi, Travis, 37
Hobbs, Walter C., 170
Hodgkinson, Harold L., 69
Hofstadter, Richard, editor, 2
Holloway, John P., 85
Horton, Byrne J., 12
Hounshell, Charles D., 46
House, J. Robert, 32
Houston, Byron, 172
Howard, Lawrence C., 169
Huganir, George H., 99

- I -

Ingraham, Mark Hoyt, 53

- J -

Jacob, Renate M., editor, 105
Jacobson, Robert L., 151, 159
Jaffe, Mark (Ivy Wall), 28
Jencks, Christopher, 3
Jewett, John, 108
Johnson, F. Craig, 69
Johnson, Lyndon B., 150
Johnson, Walter, 162

- K -

Kagan, David, 32
Kaplan, M. Stephen, 20

Katope, Christopher, 33
Katz, Joseph, (Search for Relevance), 28
Keeney, Martin G., 82
Keller, Robert J., editor, 180
Kells, H. R., 60
Kelly, Sam, 181
Keniston, Kenneth, 33
Kerr, Clark, 13, 56, 63, 66
Kidd, Charles Vincent, 117, 150
King, John E., 74
Kinney, Lucien B., 64
Kinsman, Robert S., 78
Kirk, Grayson Louis, 96
Knight, Douglas M., 67
Koen, Frank M., 90
Koenig, Herman E., 82
Koenker, Robert, 99
Kramer, Howard D., 164
Kroepsch, Robert H., 20
Kruskal, William, editor, 108

- L -

Ladd, Everett Carll, Jr., 54
Landgraf, John L., 20, 109
Lannholm, Gerald V., 40, 90
Lavergne, Daly C., 45
Lawson, Jonathan, 77
Lear, John, 151
Lecht, Leonard A., 136, 143
Lederer, G. Peter, 10
Lehmann, Phyllis, 123
Lelong, Donald C., 83
Lent, Richard H., 119
Lester, Charles T., 170, 204
Levensohn, Alan, editor, 65
Levien, Roger E., 21
Levin, Lowell S., 119
Lindem, Al, 91
Linn, James J., 156
Lipset, Seymour Martin, 54
Logan, Albert A., 54
Lowry, Howard F., 33
Lowry, W. McNeil, 109

- M -

Magoun, H. W., 14, 46, 124, 197
Mann, William R., 83
Manning, Winton H., 40
Marco, Gary L., 40, 89
Marcus, Philip M., 69
Marcus, Walter, 34
Martin, Warren Bryan, 60
Martino, Joseph P., 144
Mayhew, Lewis B., 4, 14, 205
Mayhew, Lewis B., editor, 15
McCain, James A., 109
McCarthy, Joseph L., 97
McConnell, T. R., 60
McDermott, Robert E., 78
McGrath, Earl James, 97
McMurrin, Sterling M., 98
McNett, Ian E., 151
Mehrabian, Albert, 41, 78
Messersmith, James C., 61
Millard, Richard M., 205
Miller, Carroll L., 4
Miller, John Perry, 15, 83, 172
Miller, L. S., 138
Mills, Olive, editor, 45
Monson, Charles H., Jr., 26
Morison, Robert S., 166
Morse, John F., 162
Muelder, Milton E., 98
Muirhead, Peter P., 16
Muscatine, Charles, editor, 206

- N -

Nabrit, Samuel M., 46, 169
Nam, Charles B., 129
Nash, George, 41
Nason, John W., 206
National Academy of Sciences, 21
National Academy of Sciences, Committee on Science and Public Policy, Committee on Research in the Life Sciences, 206
National Academy of Sciences, Committee on Science and Public Policy, Panel on the Plant Sciences, 136
National Academy of Sciences, National Research Council, Committee for the Survey of Chemistry, 109
National Association of State Universities and Land-Grant Colleges, Office for Advancement of Public Negro Colleges, 4
National Commission on the Causes and Prevention of Violence, Task Force on Demonstrations, Protests, and Group Violence, 34
National Conference on the Intermediate Degree, 91

National Manpower Policy Task Force, 137
National Research Council, 110
National Research Council, Advisory Committee on Governmental Programs in the Behavioral Sciences, 162
National Research Council, Office of Scientific Personnel, 124, 147, 189
National Science Foundation, 124, 137, 163
National Science Foundation, Advisory Committee for Science Education to the National Science Board, 181
National Science Foundation, Division of Science Resources and Policy Studies, 170
National Science Foundation, National Register of Scientific and Technical Personnel, 138
National Science Foundation, National Science Board, 138, 182, 190
National Science Foundation, Office of Economic and Manpower Studies, 84, 148, 152
National Science Foundation, Office of Planning and Policy Studies, 171
National Science Foundation, Planning and Evaluation Unit, Office of the Associate Director (Education), 172
Newcomb, Theodore M., 60
Nichols, David C., editor, 45
Nichols, Roy F., 54, 98
Noble, Thomas, 77
Norris, Louis William, 87
Nowlis, Vincent, 27

- O -

Odegaard, Charles E., 110, 207
Oliver, W. H., 5
Orgel, Stephen, 55
Orlans, Harold, 163
Ortega, Arturo G., 56

- P -

Page, J. Boyd, 111
Paige, Lowell J., 108
Panel Discussions, 34, 46, 56, 70, 99, 164, 172, 182
Pelczar, Michael J., Jr., 125
Pease, John, 38
Perkins, James A., 63, 67, 80
Persico, Connell F., 56
Peters, Max S., 157
Pollak, Henry O., 108
Predmore, Richard L., 172
President's Commission on Campus Unrest, 190
President's Science Advisory Committee, Panel on Educational Innovation, 197
Prior, Moody, 70

- R -

Radner, R., 138
Ramos, Juan, 46
Reeling, Glenn E., 114
Rees, Carl John, 16
Rees, Mina S., 99, 111, 182
Reilly, Richard R., 42
Reitz, J. Wayne, 164
Renetzky, Alvin, 34
Report of the President's Task Force on Science Policy, 191
Rhodes, Herbert D., 164
Richard, Ronald P., 34
Riesman, David, 3, 84
Rivlin, Alice M., 152
Rock, Miriam, 27
Roethel, David A. H., 159
Rogers, James F., 140
Roose, Kenneth D., 111
Root, Oren, Jr. (Ivy Wall), 28
Rose, Arnold M., 47
Rosenhaupt, Hans, 169, 172, 207
Rosenthal, Elsa, 16
Rosenthal, Neal H., 125
Rossi, Peter H., 70
Rossmann, Jack E., 79
Rudolph, Frederick, 17
Ruggles, Nancy D., editor, 112
Russell, John Dale, 152

- S -

Saiki, Patricia, 46
Sanchez, David J., Jr., 35
Sanders, Irwin T., 112
Sanford, Nevitt (Search for Relevance), 28, 35
Sanford, Nevitt, editor, 67
Sawyer, Ralph A., 118
Schatte, Curtis Eric, 42
Schier, Richard F., 55
Schrader, William B., 40

Schultz, John D., 182
Science, 128
Scully, Malcolm G., 99, 139, 207
Seaborg, Glenn T., 183, 191
Secrest, Leigh, 113
Selden, William K., 21
Semas, Philip W., 36
Shannon, James A., 183
Shapley, Deborah, 148
Shils, Edward, 57
Siegel, Barry N., 157
Simpson, Renate, 47
Sims, Albert G., 47, 80
Skolnick, Jerome, 34
Smith, Allan H., editor, 113
Smith, G. Kerry, editor, 17
Smith, Wilson, editor, 2
Snyder, Rixford K., 79
Spragg, S. D. S., 70
Spriesterbach, D. C., 100
Springer, George P., 48
Spurr, Stephen H., 71, 100
Starr, Paul (Ivy Wall), 28
Stern, Michael (Ivy Wall), 28
Stewart, Blair, 61
Stewart, Clifford T., 60, 158
Storr, R. J., 17
Strassenburg, Arnold A., 139
Strothmann, Friedrich Wilhelm, editor, 18
Stulberg, Robert (Ivy Wall), 28
Sullivan, Richard H., 197

- T -

Taylor, Donald W., 173
Taylor, Harold, 36, 184
Taylor, Sir Hugh S., 22
Terman, Frederick E., 114, 126
Thackrey, Russell I., 22
Thompson, Ronald B., 129
Tickton, Sidney G., 64, 140, 159
Tippo, Oswald, 36
Toynbee, Arnold J., 87
Trow, Martin, 37
Tucker, Allan, 37, 38
Tunnell, Gayle, 140
Turner, James P., 85

- U -

Union for Research and Experimentation in Higher Education, 71
U. S. Congress, House, Committee on Education and Labor, Commission on Instructional Technology, 184
U. S. Congress, House, Committee on Science and Astronautics, Subcommittee on Science, Research, and Development, 192
U. S. Congress, House, Legislative Reference Service of the Library of Congress, 23
U. S. Congress, House, U. S. Advisory Commission on International Educational and Cultural Affairs, 192
U. S. Department of Commerce, Bureau of the Census, by John K. Folger and Charles B. Nam, 129
U. S. Department of HEW, National Institutes of Health, Office of Program Planning and Evaluation, Resources Analysis Branch, 48
U. S. Department of HEW, Office of Education, 129
U. S. Department of HEW, Office of Education, Bureau of Higher Education, by John L. Chase, 27
U. S. Department of HEW, Office of Education, by John L. Chase, 173
U. S. Department of HEW, Office of Education, by Joseph Froomkin, 174
U. S. Department of HEW, Office of Education, by James F. Rogers, 140
U. S. Department of HEW, Office of Education, National Center for Educational Statistics, 174
U. S. Department of HEW, Office of the Assistant Secretary for Planning and Evaluation, 192
U. S. Department of Labor, Bureau of Labor Statistics, 126
U. S. President's Science Advisory Committee, 193
University of California, Los Angeles, 49
University of Illinois, 158
University of Virginia, Office of Institutional Analysis, 43

- V -

Valien, Preston, 49
Vanderhoof, John D., 56
Veysey, Laurence T., 5

- W -

WAGS-WICHE Committee on Graduate Education of Ethnic Minority Students, 49
Walker, Robert, 164
Walsh, John, 160, 175
Walters, Everett, editor, 101
Ward, Jennifer G., 112
Warkov, Seymour, 175
Weaver, C. E., 115
Weaver, John C., 71
Weaver, Warren, 208
Weisinger, Herbert, 101
Wenberg, Stanley J., 61
Western Interstate Commission for Higher Education, 84, 102
Whaley, W. Gordon, 18, 88
White House, President's Science Advisory Committee, 193
Wilkinson, Judith K., 60
Williams, John D., 91
Wilson, Logan, 72, 75, 81, 194, 198
Wilson, Robert C., 55
Winterbottom, John A., 20
Wofford, Harris, Jr., 60
Wolk, Ronald A., 153
Woodrow Wilson National Fellowship Foundation, 166

- Y -

Yegge, Robert B., 208
York, Carl M., 153, 194
Young, Francis A., 115
Young, Gail S., 108

- Z -

Zemach, Rita, 82
Ziegler, Jerome M., 115
Zolbrod, Paul G., 33
Zwerdling, Alex, 55